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ACCIDENTS IN FACTORIES AND ELSEWHERE.

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There are two opinions in regard to the ethics of factory management. Some represent the operative as oppressed and sacrificed by the evil environment of the factory, others represent the employers as philanthropists, whose untiring care and devotion to the interests of his employés are repaid by unthrift, insubordination, and beer.

The investigation of which the following pages contain a report was not undertaken with the expectation of discovering either of these views to be correct; but the modification of such ideas on the subject as tended rather to the first view than the second was very marked, and the result was increased hopefulness. It is true that in some factories and workshops the conditions are very unfortunate and undesirable; but with the thorough elimination of tenement-house manufacture, and the perfecting of the existing system of factory inspection by the State, they may be expected to improve even more rapidly in the future than they have done in the past. With this assurance we may be very fairly content, only remembering with all constancy our ultimate aim

and object: the securing of absolutely safe and healthful environment for those who make up the main body of our people, and whose deterioration, mental, moral, or physical, means the lowered vitality and decreased efficiency of the American nation. It is not as philanthropists, but as patriots, that we should strive to amend whatever is amiss.

The inquiry on which this paper is based was begun in October, 1893, and continued until the end of July, 1894, in the cities of Boston and Philadelphia, by means of a personal inspection of factories and workshops. To these I gained admission through the courtesy of the factory inspectors and that of the proprietors of the works inspected. In almost every case I was accompanied by an inspector, who, while himself possessing the right of admission, was invariably careful to ask permission for me to accompany him, and in not a single instance was this permission refused, while in most cases the superintendent, or whoever acted as guide, seemed interested in the investigation, and anxious to further it. I hold myself personally indebted to Chief Wade, in Massachusetts, for his kindness in this regard, and also for the use of his official library, containing many volumes unobtainable elsewhere.

In addition to personal inspection of factories, and study of records of other work done along the line of my investigation, I visited, while in Philadelphia, several offices of accident insurance companies, and there obtained the information on that subject, which will be found in this report. The investigation included all the sanitary conditions of the trades inspected, but was somewhat handicapped by the financial crisis of 1893–94, many factories having suspended work, or else running short-handed or on half time. But while this must be remembered as modifying the results of the investigation, they are by no means thereby invalidated. On the contrary, longer hours and an increase in the number of workers would simply mean an intensification of bad conditions, and a lowering of such as I found fairly good.

The proportion of accidents in the several trades has been roughly estimated for the purpose of classification as good or bad risks by the accident insurance companies. Outside of this, no scientific classification has been even attempted. It is a subject upon which employers are not disposed to be communicative, and an opposite disposition on the part of an employé is usually requited by dismissal. It is therefore a subject to be approached from several points, and somewhat cautiously. The first step in my investigation was to endeavor to ascertain the ratio of fatal accidents to the total number, irrespective of occupation. From an examination of 1000 cases taken from the books of the Pennsylvania Hospital I find the deaths not more than 50, or 5 per cent. As will be seen from the subjoined tables, the ratio of fatal accidents to the whole number reported by the factory inspectors is more than twice as great, but in one of the occupations considered most dangerous by the insurance agents the ratio is 1 in 62, or a little less than 2 per cent. This should be remembered as qualifying the classification subjoined, for the point of view of an insurance man is not the severity but the frequency with which accidents occur. The manufacture of buttons, for example, is considered dangerous, but a button-maker can hardly injure himself more seriously than by crushing his fingers; but as this incapacitates him for work, perhaps for several weeks, and sometimes involves the loss of the hand, he is considered a bad risk.

I call the classification a rough one because the gentleman from whom it was obtained informed me that he proposed to improve it, and that he is now collecting statistics for that purpose. A sufficient number (20,000 cases) cannot be collected under four or five years.

It will be observed that the fifth and sixth classes are only semi-insurable,— that is to say, the company will not write policies for persons engaged in them. But if persons insured under other classes should be accidentally injured while temporarily engaged in one of the dangerous occupations, he may receive the sick or death benefits assigned to that class.

The following is the table of Indemnities for the six classes of occupations: —

Benefits.	Class.					
	I.	II.	III.	IV.	V.	VI.
Death by accident	$5,000	$4,000	$3,000	$2,000	$1,000.00	$500
Loss two limbs	5,000	4,000	3,000	2,000	1,000.00	500
Loss one limb or two eyes	2,500	2,000	1,500	1,000	500.00	250
Loss one eye	650	300	200	150	100.00	75
Permanent total disability	2,500	2,000	1,500	1,000	500.00	250
Weekly indemnity not to exceed 52 weeks	25	20	15	10	7.50	5

CLASSIFICATION OF DANGEROUS OCCUPATIONS.

NOTE.— Proprietors of factories and mercantile establishments whose duties are supervising or office work only — except when engaged about dangerous machinery, molten metal or explosives — are insurable in the first class.

CLASS I.

Accountant.
Actor or actress.
Actuary.
Adjuster.
Agent.
Apothecary.
Architect (office duty only).
Army or navy officer (not in service).
Artist.
Assayer.
Assessor.
Attorney.
Auctioneer.
Auditor.
Author.
Autographer.
Baker (supervising).
Bank clerk or officer.
Boiler manufacturer (supervising or office work only).
Book-keeper.
Boot and shoe dealer (office work).
Broker.
Cashier.
Cattle dealer (office work).
Civil engineer.
Clergyman.
Clerk (office or counter or travelling).
Coal operator or dealer.
Coffee-house keeper (not saloon).
Commission merchant (supervising).
Concert singer.
Confectioner.
Consulting engineer (office).
Contractor (office).
Copyist.
Corporation officers.
Cotton sampler.
Dentist.
Dramatic agent.
Draughtsman.
Druggist.
Editor or reporter.
Farmer (supervising or not working).
Florists, city.
Gauger, U. S. Revenue Service.
General manager.
General master mechanic, office duty.
General superintendent.
Grocer, superintending, or not handling heavy packages.
Hotel keeper or clerk, city, not tending bar or stables.
Ice merchant, office.
Insurance man.
Jeweler, working in store.
Launderer or laundress, office.
Lawyer.
Lecturer.
Librarian.

CLASS I.—*Continued.*

Letter carrier.
Marshall, U. S.
Mechanical engineer.
Milliner.
Music teacher.
Nurse.
Organ tuner.
Pawn broker.
Phonographer.
Physician.
Postmaster or clerk.
President, bank or corporation.
Printer, type-setter.
Publisher.
Sculptor.
Secretary.
Sexton, church, not grave-digger.
Sheriff, city.
Stationer.
Stenographer.
Tailor, merchant.
Telephone inspector.
Typewriter.
Undertaker.
Wig maker.

CLASS II.

Army and navy officer, in barracks.
Artificial flower maker.
Barber, proprietor.
Billiard saloon keeper.
Book-binder.
Builder and contractor, supervising.
Chemist, laboratory work.
Cloak-maker.
Clock-maker.
Clerk in hardware store, not handling heavy goods or explosives.
Clerk on river steamer.
Clerk, shipping and delivering goods.
Commission merchant.
Contractor for railroads or public works, supervising only.
Cotton weigher.
Cotton or woollen mill overseer.
Cutter, shirts and clothing, hand work.
Etcher.
Superintendent of fire alarm.
Flour inspectors.
Gauger, oil.
Gauger, store or warehouse.
Machinist, foreman.
Master builder, not working.
Merchant, grocery, delivering goods.
Merchant, general country store.
Naval architect or constructor, supervising.
Newspaper carrier.
Piano makers.
Painter, sign, in shop.
Fibre manufacturers, proprietor, superintending.
Fibre manufacturers, superintendent.
Gravity railroad employés, civil engineer.
" " " superintendent.
Superintendent iron and steel workers.
Lumber manufacturer, proprietor.
Miners, superintendent.
Oil men, superintendent, pipe line.
Contractor for building railroad.
Conductor, sleeping, hotel, or drawing-room car.
Superintendent of telegraph.
Train agent.
Train master.

CLASS III.

Architect, supervising construction.
Armorer.
Awning or tent maker.
Baker, driving wagon or working.
Barber, journeyman, on steamboat.
Bicyclist, teacher or exhibitor.
Bill poster.
Blacksmith, working, not horse shoer.
Bleacher.
Blind, door, and sash maker, not using circular saw.
Boarding-house keeper.
Boatman.
Boot and shoe maker, hand work.
Britannia-ware maker.
Broker in cattle and horses.
Butcher, market or stall.
Carpenter and joiner, not using circular saw.
Carriage painter.
Cider manufacturer.
Cigar maker.
Coachman, not hostler.
Confectioner, working.
Constable.
Cook, professional.
Copperplate printer.
Corset maker.

CLASS III.—*Continued.*

Cotton packer or presser.
Driver of horse car or light delivery wagon.
Drover, not tending cattle in transit.
Electrotyper.
Engraver on steel work, stone, etc.
Expressman, city.
Fire marshall.
Flax dressers.
Florists, country.
Freight agent at station, not coupling or switching.
Fresco painter.
Furrier.
Galoon, gimp, and tassel makers.
Gardener.
Gas meter inspector.
Gilder.
Glove cutter or stitcher.
Goldsmith, beater, refiner, or worker.
Hardware dealer, handling heavy goods.
Hat and cap maker.
Horse dealer, not trainer.
Hotel keeper or clerk, country.
Insane keeper, or attendant of.
Inspector of Indian agencies.
Ivory for bone turners or cutters.
Janitors.
Jeweler, working in factory.
Lace maker.
Lapidary.
Lithographer.
Locksmith.
Machinist.
Mail service, on railroads.
Marble cutter.
Metal refiner.
Model maker.
Nurseryman, working.
Paper hanging.
Picture frame worker, not using circular saw.
Pistol maker or gunsmith.
Planter.
Pressman, printer.
Print works operative.
Spectacle maker.
Spinner, silk or thread mill.
Tailor, working.
Taxidermist.
Teacher in school.
Telegraph operator.
Tinner, not roofer.
Upholsterer.

CLASS IV.

Agricultural implement maker.
Ale and beer manufacturers.
Analytical chemist.
Artificial limb maker.
Baggage master at station.
Bag maker.
Basket maker, splitter and weaver.
Beef handler, in warehouse.
Bell hanger.
Boiler inspector.
Bolt maker.
Bone and ivory workers.
Boot and shoe maker, machine work.
Brass finisher or polisher.
Brick and tile maker.
Brush and broom maker.
Butcher.
Button maker, bone or ivory.
Cabinet maker, not using circular saw.
Canal dock employés.
Candle maker.
Captain or mate of river, sound, or tug boat.
Carpenter or joiner.
Carpet-bag maker.
Carpet weaver or layer.
Carriage maker.
Cement and clay-pipe maker.
Chair maker.
Cheese maker.
Coffee roaster or packer.
Coffin maker.
Condensed milk factory employé.
Coppersmith.
Cordage and rope maker.
Core maker.
Cork cutter.
Cotton dyer or printer.
Cotton or woollen mill operative.
Cracker maker.
Creamery worker.
Currier.
Cutlery forger, finisher, gatherer, etc.
Cutter, boots, shoes, and clothing.
Dairyman.
Die engraver.
Electroplater.
Elevator man.
Embosser.
Embroidery stamper.
Emery, cloth and paper maker.
Enameler.

CLASS IV.—*Continued.*

Envelope maker.
Farmer.
Felt maker.
Gas fitter.
Gas works employés.
Glazier.
Glover.
Glue and mucilage maker.
Grindstone maker.
Gunsmith.
Hollow woodenware makers.
India rubber factory employé.
Ink maker.
Japanner.
Knitting mill operative.
Lead workers.
Looking-glass maker.
Malleable iron workers.
Mason, brick or stone.
Mattress maker.
Metal spinner or presser.
Millwright.
Pencil maker.
Plasterer.
Pump maker.
Rosin, tar, and turpentine makers.
Rule or level makers.
Saddler.
Sailmaker.
Salamander breaker.
Steel pen makers.
Spool turner.
Spring maker.
Starch maker.
Straw worker.
Talc miller.
Tallow chandler.
Thread maker.
Tobacco factory operative.
Type founder.
Umbrella maker.
Veterinary surgeon.

CLASSES V AND VI.

Acid works employés.
Artesian well borer.
Axe grinder or maker.
Band sawyer.
Barb wire worker.
Bargeman. 6.
Bark peeler.
Brass founder.
Bridge builder, putting up.
Buzz planer or sawyer. 6.
Canal boatman. 6.
Celluloid worker.
Chain maker.
Charcoal burner.
Cider-man or snapper.
Circular sawyer. 6.
Coal heaver. 6.
Coke drawer or charger.
Cutlery forger, hot drop.
Cutlery grinder or polisher.
Engineer or fireman of river, lake, sound, or tug boat.
Firemen.
Fishermen.
Gang sawyer.
Hide and skin workers.
Indian agent.
Moulding machine worker. 6.
Nail maker.
Roofer.
Pulp mills employé.
Scythe maker.
Shingle makers. 5 and 6, according to nature of the work.
Slater.
Slate quarrier. 6.
Soap boiler.
Spindle maker.
Spindle grinder.
Stove makers and workers.
Tack maker.
Telegraph builder or repairer.
Thresher, with machine.
Varnish maker.
Well digger. 6.
Vitriol manufacturer. 6.
Wire makers.

The following occupations are all included under Classes IV, V, and VI, according to the kind of work pursued by the employé, except that office work sometimes entitles him to insurance in a higher class: —

Electric light employés. Only in V and VI.
Fibre manufacturers.
File makers.
Furniture factory employés.
Glass works employés.
Gravity railroad employés. Only in V and VI.
Glucose works employés.
Horse railroad employés.
Iron and steel works. Only in V and VI.
Lumbermen.
Miners, coal, gold, silver, quartz, or copper.
Oil men.
Quartz mill employés.
Railroad employés.

NOT INSURABLE.

Acrobatic performers.
Aeronaut.
Army officer in field service.
Base ball player, professional.
Captain or mate of coasting or sea-going vessel.
Cartridge maker.
Circus rider.
Submarine diver.
Engineer or fireman, sea-going vessel.
Firework maker.
Fisherman. Insurable for death only.
Percussion-cap maker.
Pilot, outside.
Powder maker.
Sailor.

In 1890 and 1891 nearly all the accidents from a certain factory in Philadelphia, engaged in the manufacture of locomotives, were carried to the German Hospital, and an examination of these gave results indicated in the table below. There is, however, an hiatus of about a year, caused by the loss of one of the books of the hospital. In this examination I had the co-operation of a gentlemen who was, at the time mentioned, one of the hospital staff. He was of the opinion that while the books may not record all the accidents at these works for that time, as some may possibly have been sent to other hospitals, or in the hurry of receiving them may not have been properly recorded, yet they represent a very fair proportion of them, and give us a fairly accurate idea of the number and gravity of the accidents in a locomotive factory.

DIAGNOSIS OF INJURY.

	Number of Cases.
Lacerated, incised, or contused wounds,	30
Fractures,	9
Contusions,	9
Crushings,	8
Sprains,	4
Abscess,	1
Dislocations,	1
	62

CHARACTER AND LOCATION OF INJURY.

	Number of Cases.
Fracture of skull,	2
Other injuries to head and face,	7
Injuries to body, thighs, and shoulders,	9
Injuries to legs and arms,	11
Injuries to hands and feet,	30
Other injuries,	3
	62
Deaths,	1
Amputations,	3
Admitted to hospital for treatment,	6
Dismissed after treatment,	52
	62

During the time represented by these tables the works were running on full time and full handed. At the time of my investigation (the summer of 1894) there was less work to be had, and, consequently, the men were not, as it was expressed to me, "crowded into the machinery," and there were fewer accidents. The conditions have, however, been greatly modified since 1890–91, and the sanitary condition, in the factory report, is marked "Good."

The accident reports of the factory inspectors of Pennsylvania for 1892 and 1893 show the following figures: —

	1892.	1893.
Total number of accidents	246	319
Fatal	24	46
Serious	97	154
Less serious	125	120
Due to carelessness of victim	27	33

"The increase in the total number of accidents reported is misleading," says Chief Watchorn in his report, "and is due to the increased efficiency of the department. It is not that more accidents have occurred, but that the inspectors have been able to get hold of more." We must, however, qualify this assertion by a reference to the *kind* of accidents reported. It is comparatively easy to keep a slight accident from the knowledge of the inspector, but much more difficult, if not

impossible, to keep from him a fatal accident. Now, we find in our table that the fatal accidents were in one year only one-tenth of the whole number; but in 1893 they were more than one-seventh. The same relative increase is observable in the "Serious Accidents," while the "Less Serious" show a diminution which is absolute as well as relative. Therefore we are obliged to conclude that in this year there was an increase in the number of serious and fatal accidents, though it is undoubtedly true also that the department are getting a better hold of their work each year. In June, 1894, a fatal accident was reported from a factory in Philadelphia, and when the inspector visited the ground he found that a less serious accident had taken place about a fortnight before which had not been reported. And the testimony from all quarters goes to prove that accidents are not reported except under compulsion, and that an employé who tells of one that has occurred is practically sure of his discharge.

It will be observed that about one-tenth of the accidents in each year are ascribed to the carelessness of the victim. There is no doubt that this factor plays a large part in the matter. Human nature gets accustomed to danger, and uses dangerous machines without proper respect for their powers. Moreover, the tendency of public opinion among workingmen is to despise a man who takes precautions, perhaps even to call him cowardly, until he is killed or injured, when he is stigmatized as reckless. An accident which occurred not long ago in Philadelphia, in the very factory from which we have had so many cases, will exemplify this. Four men had been working inside of a boiler rivetting the plates and using benzine as a lubricator. They left their work at the dinner hour, and, returning afterward, took it for granted that the fumes of the benzine had entirely dissipated, and entered the boiler with a lighted candle. The consequence was an explosion with fatal results. Another instance is of a boy working at a machine moved by a belt, or shaft, as it is called. The shaft was covered in several feet up from the ground,

but the boy, who was more interested in a conversation with one of his mates than in his work, leaned over to adjust his machine with one hand while the other rested on the body of the machine, and in this position he was caught by the shafting and his arm torn from his body. Another case is that of a man who was working on piece work and wanted to start his machine up in the morning a little ahead of time. Instead of applying to the machinist, whose business it was, to put on the belt for him, he climbed on a ladder to put it on himself; but some part of his garments caught in a projecting screw and he was carried around with the belt and so frightfully mangled that death would have been a relief. The inspector ordered the screw removed, but to my thinking there was no reason to do so. It was far above the reach of even a tall man, and was not supposed to be meddled with by anyone but the skilled machinist, who ought to know enough not to put himself in the way of getting hurt.

But with all these qualifications we must, nevertheless, not blame the workingman too much for carelessness. The testimony goes to show that there is an element of greed on the part of the employer which forces the men to work under dangerous conditions rather than take proper precautions, which involve expenditure of money; and, also, that fellow employés will accuse a dead man of carelessness rather than risk their own dismissal by impeaching the employer.

In Massachusetts the machinery in use is fairly well protected, though even in Massachusetts the standard is lower than it is in England. For example, a dynamo, such as we find in use in the power-house of an electrical car company, is in England always protected by a wire netting. In this country not only are the dynamos unprotected, but the wires within the power-house, which line the roof above our heads as we pass through, are generally not insulated, so far as I have been able to learn, and accidents are frequent among the workmen who have to do with them. Out of doors most of the wires are supposed to be insulated, except the centre

wire, on which the trolley rod runs. But the insulation is not always complete, and many fires and other accidents are the result.

A source of danger to the general public, as well as the employés, is found in the character of the men employed as motormen and conductors, very few of whom have any but the crudest ideas of electricity. A line in Boston, when work was first begun, compelled all conductors and motormen to serve an apprenticeship in the machine shops, but press of business and, doubtless, questions of economy prevented the continuance of this most excellent practice. It is doubtful whether the present practice is, in fact, economical, as the untrained electricians destroy the property of the company by their ignorant handling, as well as endanger the lives of passengers. From our table we find that electricians are classed V and VI with the exception of "telegraphers not working."

The question of insurance for workingmen is a most interesting one. The *Report of the Commissioner of Labor for 1892* shows that fifteen states have passed laws relating to the liability of the employer for injuries to his employés. Some of these merely relate to railroads, others to mines. The Massachusetts law is by far the best. The main point on which that State is now seeking to improve her code on this subject might be imitated by every State in the Union. This is *compelling an employer* to prove negligence on the part of the employé. In the department of manufactures this already obtains, but even in Massachusetts railroad employés are still compelled to prove an employer careless in order to obtain damages.

The first result of any labor legislation has always been some movement on the part of the employer which more than recoups him against the supposed heavy losses which he had previously pitied himself for sustaining under the measure under consideration, and the outgrowth of the employers' liability laws has been the employers' liability insurance com-

panies, which insure the employer against lawsuits for damages on the part of employés. As examples of them I may give the Employers' Liability Assurance Corporation, London, England, the oldest of all, having been incorporated October, 1880; The Employers' Mutual Indemnity Company, Philadelphia; and The Guarantors, Philadelphia. The last named have been in business only about a year. These companies insure the employer direct, and not the employé. Their returns do not give us any clue to the actual number of accidents, although every accident occurring in the factory is reported to them with far greater care than to the factory inspectors, from whom, as we have seen, there is a tendency to keep it if possible. But accidents which do not threaten a law suit are not noticed in any way. I cannot find that a record of any kind is kept of them. Such accidents may be very serious. The boiler explosion mentioned above, for example, was so clearly the result of carelessness that it would not have interested them at all. But with these deductions from their value some figures from their reports for 1893 may be interesting. They refer only to business done in Philadelphia.

EMPLOYERS' MUTUAL INDEMNITY CO.

	Number.	Amount.
Policies or certificates in force December 31, 1892, . .	57	$965,000.00
Policies or certificates written in 1893, ...	111	1,825,000.00
Total, ...	168	$2,790,000.00
Losses and claims on policies and certificates incurred and paid during 1893, ...	24	$1,875.00

It is interesting to note that in this statement the losses are exactly one-seventh of the risks.

THE GUARANTORS.

	Risks.	Premiums.
In force on the 31st of December, 1892, . . .	$3,974,000.00	$37,471.92
Written or renewed during the year, ...	10,304,946.00	217,446.48
Total, ...	$14,278,946.00	$254,918.40
Deduct those expired, ...	3,851,500.00	29,796.35
Net amount in force December 31, 1892, . . .	$10,447,446.00	$225,122.05

Losses incurred during the year, $17,484.67.

In this case the number of policies issued is not given, but if the average amount for which a policy is written be the same as in the case just cited the number of policies would not exceed ninety-one or two.

EMPLOYERS' LIABILITY ASSURANCE CORPORATION.
United States Branch.

Business in the State of Pennsylvania during the year.

Amount of risks written,	$13,167,472.00
Amount of premiums received,	65,837.36
Amount of losses paid,	16,842.69
Amount of losses incurred,	13,497.69

In this table the gross number of losses is $30,340.38. Here also the number of policies is not given, but calculating as in the last case it is probably about 825.

We have, therefore, for the State of Pennsylvania, for these three companies alone, and without computing the amount paid to workingmen by other accident insurance companies, the following figures: —

LOSSES PAID DURING 1893.

Employers' Mutual Indemnity Company,	$1,875.35
Guarantors,	17,484.67
Employers' Liability Assurance Corporation,	30,340.36
Total,	$49,700.40

This amount was paid to employers to indemnify them for damages which they were compelled to pay to employés injured in their service and by their fault. It may be considered as by no means representing the amount which should have been paid for the same purpose, inasmuch as very many firms do not insure at all. The works from which we have quoted so many accidents do not insure themselves; there is an insurance feature among the men, but so few belong to it as to make it unimportant for statistical purposes.

It is interesting, before we leave the subject of insurance, to note the very different light in which it is regarded by the factory inspectors of Massachusetts and Pennsylvania. In the latter State the insurance companies are regarded with some suspicion; and there is a story told of an employer

who, being threatened with the terrors of the law on account of his unprotected machinery, replied that he did not care how many of his working people were injured, as he was fully insured. On the other hand, the Massachusetts inspectors say that they prefer to go through a factory just after the agent of an insurance company has inspected it, as it saves them all the trouble of issuing injunctions, etc., the agents having already made sure that the machinery is all well protected. The explanation seems to be that the more stringent the factory laws, the more easily can they be enforced. Massachusetts has had nearly fifteen years of factory inspection, and is growing accustomed to the idea that human life must be protected, even if it costs money to do it. In Pennsylvania the inspection system is some years younger, and even insurance agents cannot bring the employer up to the point of properly protected machinery all at once.

It only remains to give an account of some typical accidents that have come under my own observation, with their methods of prevention. They are, of course, of a slight nature; for as regards the more serious accidents, their character and the means of preventing them have been understood for many years, and, in fact, could never have been otherwise. Everyone knows and must know that a shaft coming up through the floor and revolving rapidly is dangerous to a careless passer-by, though it may be possible to avoid it; and as a general rule wheels and shafting should be boxed in to a sufficient height above the floor to protect the skirts of the women employés. The men are in less danger. Shafting also is met with, running horizontally through the room at such a height as to prevent even an ordinary-sized man from passing without stooping; and I saw a hat belonging to a factory inspector which was "stove in" in this way. The inspector said if he had been two inches taller the shaft would have taken the top of his head off. Such negligence as this is criminal; for even where it is essential to have the

shafting run at just that height and no other, it is not a difficult or costly matter to have it boxed in. Overcrowding of the machinery is another source of danger. I have been in factories, notably in jute works, where the alley between the rows of wheels and belts was so narrow that I paused a moment before entering upon it, and wished I had taken out an accident policy. At these machines only girls were employed. I may mention that the girls had not only skirts, but in one or two cases flowing sleeves. A model working dress for factory employés would be the divided skirt and a blouse, the sleeves of which should terminate at the elbow, where they might be gathered into a buttoned band. But working girls, as a rule, cannot afford to have separate working dresses; they must, or think they must, wear out their old dresses in the factory. And, if they could afford it, the next thing would be to persuade them that it was a prettier and more suitable, and in every way more becoming mode of doing things, than their present habit of tattered finery and curl-papers. Another skirt might be worn to and fro on the street and left in the dressing-room. The blouse could be made of flannel for the winter and of calico for the summer. This dress would make a woman's life as safe in a factory as a man's, as the skirt does not fly out as an ordinary skirt does, and if properly made is perfectly modest, and not very noticeable.

In the jute factory, in one of the alleys which came under my attention, a set of exposed bobbins were protected (the invention of the factory inspector) by a shield resembling an oven door. They could not be permanently boxed in, as it was necessary to get at them to change the bobbins; and a movable door, such as is often used, was impossible, as there was not room enough for it to swing open. The inspector devised two doors, opening in the middle.

In a silversmith's I found a man who had had his hand very severely hurt under a hammer. The huge and ponderous machine used for stamping out the dies is worked by

hand, and, not being securely fastened, fell at an unexpected moment. The inspector suggested an iron hook such as is sometimes used to fasten window shutters. When the hammer is raised this hook is inserted in a small hole in the hammer itself. It seems a trifle, but has proved an efficient protection.

In the jute factory one department is given to making twine. After the ball is wound it passes through a machine which gives it that taper waist which all of us know so well in balls of twine. These machines are operated by boys; and as it is not in the nature of things for a boy to be careful, they are apt to have their fingers mashed by putting in the ball too far to one side or the other.

In the type foundry is a machine used for casting type, in which the metal to be cast is to be kept fluid by a little furnace underneath. It is projected into the mold by a pump, the spout of which is in front of the metal-pot. The mold is movable, and at every revolution of the crank it comes up to the spout, receives a charge of metal, and flies back with a fully-formed type in its bosom. The upper half of the mold lifts, "and out jumps a type as lively as a tadpole." So says the *American Printer*. In most of these machines the type cast is so small that there is no danger to be apprehended beyond a slight burn; but with those used to cast the large ornamental types for chapter heads, etc., the charge of metal is so large as to knock a man down if received point blank. In one of these, which fortunately was being used at the moment for a medium-size type, the metal became clogged in the melting-pot so that it did not flow freely into the mold. In consequence it was driven out, and took the caster full in the eyes. The melted metal sealed up his eyes, and had to be cut open. Fortunately, his sight was not seriously injured, though his eyelids bear the scar of the burn. To prevent the recurrence of the accident he screwed a flange of iron just over the vent, so as to catch and divert the metal; for the

clogging of the metal-pot is something that happens hourly. A similar precaution might be taken with advantage with all casting machines, for even a slight burn is worth guarding against, when it can be done at such slight cost.

A necessary point for reform is the condition of the cloak-rooms. In one case, that of the same jute works, I found the sanitary conditions very bad indeed, tending to typhoid fever and similar diseases. The toilet and cloak rooms were combined, and the girls had no other place to eat their lunch but in an atmosphere too foul to breathe with safety to health. It was also their only place to retire even for a moment to obtain relief from the noise of the machinery, which was so loud that it was almost impossible to speak so as to be heard by anyone standing close by. In most factories the girls are apt to eat their lunch in the cloak-room; and as this always adjoins the toilet-room, the result is bad unless the sanitary conditions are perfect.

In the case of the factory where these conditions obtain the inspector is correcting them as fast as she can, but it is a case where haste must be made slowly; and to make too many demands at once upon the manufacturer would simply involve the department in a succession of law suits, whereby any benefit to the employés would be indefinitely deferred. It has but little to do with the purpose of this report, but I wish to make a statement just here in relation to the factory inspectors, so far as my work has brought me in contact with them. They are frequently made the subjects of criticism, not only by laboring men, who supposed the creation of a department of factory inspection would at once end all the woes that labor is heir to, but by others interested in the welfare of working people. So far as I have seen, however, they are much like other people, only, as a class, better. Those with whom I have had dealings have appeared to me, without exception, honest, upright, and anxious to do their duty without fear or favor. Of course they may make mistakes and may err sometimes on the

side of making haste too slowly; but it should be remembered in their favor that they are tremendously overworked, and have a task on hand which ten times their number could scarcely perform as it should be done. A woman engaged in reform work in New York said, in reply to my question as to the inspectors of that city, that if there were three thousand of them, so that one could encamp at the door of each tenement house workshop, for example, they might possibly hope to accomplish what people expect of them. Therefore a very definite point to work for in the prevention of disease and accident among working people is *an increase in the number of factory inspectors.*

THE MARRIAGE RATE IN MASSACHUSETTS.

By F. S. Crum.

The following paper is a portion of a thesis presented, in June, 1895, by Mr. Crum, in candidacy for the degree of Master of Letters at Cornell University. It was prepared under my superintendence, and I believe the statistical tables and results to be trustworthy. *W. F. Willcox.*

Of the several States which attempt, with varying degrees of success, to carry out registration, Massachusetts has perhaps the most perfect, and certainly the oldest, system. It was the Commonwealth of Massachusetts that instituted civil registration of births, marriages, and deaths in this country. England first made provision for civil registration in 1836, and it was largely under the influence of England's example that Massachusetts enacted the registration law of March 3, 1842.* This first law proved to be crude and inadequate, and was replaced March 16, 1844, by an act† modelled closely after the English law, and providing a more efficient system of registration. This act has been supplemented and amended at different times to suit the steady development and improvement of the registration system.

The data contained in the earliest registration reports of Massachusetts are admittedly very incomplete, but I think we may consider those collected since 1850 fairly complete and accurate. In the following pages an attempt has been made to review, along certain lines, the statistics of marriages in Massachusetts since 1850.

The population of a country or district may be studied statistically from two quite different points of view. We may analyze the population as it appears at a given moment, or we may study the changes in the population between two points of time due to births, deaths, and migration. In the former case we study population at rest or as static, ascertaining the number, the age and race distribution, the civil

* Second Annual Registration Report, pp. vii–viii.

† Thirteenth Annual Registration Report, pp. 204–206.

condition, etc., of the people; in the latter case we study population in motion or in its dynamic aspect, ascertaining the additions to and subtractions from the population. These dynamic changes are what we mean by "movements of population."

In a statistical study of marriage the first thing to be considered is the marriage rate,— that is, the ratio between the number of people among whom marriages may occur, and the number of marriages occurring among them in a given time, usually a year. It expresses "in figures the strength of the social tendency or desire to marry, so far as that tendency finds realization in marriage." The marriage rate may be determined in several ways. The number of persons marrying in a given year may be compared (1) with the total estimated population in the middle of that year; or (2) with the adult population, eliminating the children, usually taken to be all those under 15 years; or (3) comparison may be made between the number of marriages and the adult marriageable population, eliminating both the children and those already married. These three methods are of varying degrees of accuracy. In measuring the extent of any social phenomenon, the actual cases should be compared with the possible. The first or crude method of computing the marriage rate, which compares the number of persons marrying with the total population, is the only method at present available for purposes of general comparison, but it is inaccurate, because the great bulk of the total population have nothing to do with the number of marriages occurring in a given year. The young in most countries, and the married in monagamous countries, are not allowed to marry. The second method, therefore, which computes the rate on the basis of the total adult population, is more accurate than the first, but it does not eliminate the married, who form a large part of the ineligibles. The third method approaches more nearly the theoretical ideal, by comparing the number of marriages with the adult persons whose civil condition does not preclude them from marriage.

A fourth and still better method, by which the marriage rate for each age group is found by comparing the marriages of people of each age group with the number of unmarried of that group, is not yet applicable, I believe, in any American State. Either the marriages by age groups or the conjugal conditon by age groups is everywhere lacking. Now that the United States Census of 1890 has given us for the whole country the latter information, we may hope that this method will come into use.

For a computation of marriage rates two sets of data are necessary: (1) the number of marriages occurring in a given year or series of years, and (2) the population — total, adult, or unmarried,— for the particular year or series of years. The former datum is furnished by the annual registration reports; the latter may be estimated from the results of the censuses. The marriage returns of Massachusetts for the past forty years have been fairly complete, and fortunately, during this period, quinquennial censuses have been taken. In addition to the national censuses there have been State censuses taken in 1855, 1865, 1875, and 1885. The censuses contain data enabling us to compute the marriage rate according to the first two methods for the whole period since 1850. Owing to lack of data, the third method, which compares the number of marriages with the adult marriageable population, can be employed only for the years since 1875, for only in the State censuses of 1875 and 1885, and in the United States census of 1890, are data to be found as to the conjugal condition of the population of Massachusetts.

As the number of marriages must be compared with the population of the same year, it becomes necessary to estimate the latter for the intercensal years. There are two principal methods for estimating the population: (1) it may be assumed that the amount of increase is the same for each intercensal year, or (2) it may be assumed that the rate of increase is uniform.* The former method makes no allow-

* Newsholme, *Vital Statistics*, pp. 3-7.

ance, as does the latter, for the increasing number of parents year by year, as a result of a growing population, in which we may fairly presume that an increasing number are year by year attaining to marriageable age.

For this reason the latter has usually been deemed the more accurate method, and where the rate of growth is nearly constant it unquestionably is so. But in most of our States, as in the country as a whole, there is a tendency for the rate of increase to fall from decade to decade. When this occurs, the assumption of a constant amount of annual increase may easily give more accurate results than the assumption of a constant rate. It is therefore desirable to ascertain which method will give the more accurate results in Massachusetts for the period in question. The only mode of testing the accuracy of our estimates of population is by comparing them with the results of enumerations.

Accordingly, the population at the date of each census, from 1885 to 1890 inclusive, has been estimated by each method from the results of the preceding and following enumerations. The variation of these estimates from the census figures showing the population at the same date has then been computed, and is shown in the following table:—

TABLE SHOWING THE RELATIVE ACCURACY OF THE TWO METHODS OF COMPUTING POPULATION FOR INTERCENSAL YEARS.

Date of Census.	(1) Enumerated Population.	(2) Population by Arithmetical Method.	(3) Population by Geometrical Method.	(4) Variation of Column (2) from Column (1).	(5) Variation of Column (3) from Column (1).	(6) Per Cent Variation (2) from (1).	(7) Per Cent Variation (3) from (1).
June 1, 1850	994,514	.....	.....	.....	.....	.....	.....
June 1, 1855	1,132,369	1,112,790	1,106,070	−19,579*	−26,299	−1.73	−2.32
June 1, 1860	1,231,066	1,200,265	1,198,050	−30,801*	−33,016	−2.50	−2.68
May 1, 1865	1,267,031	1,342,322	1,337,081	+75,291	+70,050*	+5.94	+5.53
June 1, 1870	1,457,351	1,462,676	1,450,009	+5,325*	−7,342	+0.37	−0.50
May 1, 1875	1,651,912	1,617,504	1,609,065	−34,408*	−42,847	−2.09	−2.60
June 1, 1880	1,783,085	1,799,445	1,793,058	+16,360	+9,973*	+0.92	+0.56
May 1, 1885	1,942,141	2,007,214	1,994,075	+65,073	+51,934*	+3.35	+2.67
June 1, 1890	2,238,943	2,223,351	2,206,004	−15,592*	−32,939	−0.70	−1.47
May 1, 1895	2,495,345	.....	.....	.....	.....	.....	.....
Average....	.....	.....	.....	.....	.....	2.20	2.29

The estimated numbers marked with * correspond more nearly with the enumerated population.

The preceding table shows that in five cases out of eight the arithmetical method gives somewhat more accurate results. It is also much simpler. These are my reasons for abandoning the usual method employed by Dr. Farr and followed by the Massachusetts Board of Health and the Registration Reports.

The registration year corresponds in Massachusetts to the calendar year; and as the censuses are taken on June 1,— or, in the case of the State censuses of 1875 and 1885, on May 1,— the enumerated populations have been corrected by adding the estimated increase of one month or two months, as the case might be, in order to obtain the mean population, or population for July 1, the middle of the year.

With these explanations as to method, we may pass to a consideration of the marriage rates of Massachusetts. The following table and diagram show the changes in the three rates as computed by the different methods. A given point on a curve indicates the relation of two elements, the marriage rate and the year; while the broken line connecting the points constitutes a curve whose varying distance from the base marks the variations of the rate from year to year. The marriage rates thus graphically represented on the same scale bring to light two facts: (1) the ups and downs, the fluctuations in the curves, are very prominent; and (2) the movement of the three curves differs in distance, but not in direction. All move up and down together.

That there is an intimate connection between the fluctuations in the marriage rate of a population and its economic prosperity has long since been pointed out. Dr. Farr, the great English statistician, once said: —

"The number of marriages in a nation perhaps fluctuates independently of external causes, but it is a fair deduction from the facts that the Marriage Returns in England point out periods of prosperity little less distinctly than the funds measure the hopes and fears of the money market. If the one is the barometer of credit, the other is the barometer of prosperity, present in part, but future, expected, anticipated, in still greater part."*

* Farr, *Vital Statistics*, p. 68.

Owing to an error, the Diagram will be furnished with the March number.

TABLE I.

MASSACHUSETTS' MARRIAGE RATES.

Years.	Marriages.	Persons Marrying to 1000.			Marriages to 1000.	
		Total Population.	Adult Population Aged 15+.	Adult Marriageable Population.	Adult Males 18+.	Adult Females 15+.
1850	10,345	20.8	30.4	....	34.3	29.5
1851	11,966	23.4	34.6	....	38.9	33.3
1852	11,578	22.0	32.5	....	36.9	31.4
1853	12,828	23.8	35.2	....	40.0	34.0
1854	13,683	24.7	36.8	....	41.8	35.4
1855	12,329	21.7	32.5	....	37.0	31.2
1856	12,265	21.3	31.6	....	36.1	30.4
1857	11,739	20.0	29.7	....	33.9	28.5
1858	10,527	17.7	26.1	...	29.8	25.0
1859	11,475	18.9	27.9	....	31.9	26.6
1860	12,404	20.1	29.6	....	33.9	28.3
1861	10,972	17.7	26.0	...	29.4	24.5
1862	11,014	17.6	25.9	....	28.9	24.1
1863	10,873	17.3	25.4	....	28.0	23.3
1864	12,513	19.8	29.0	....	31.6	26.3
1865	13,051	20.5	30.1	....	32.4	26.9
1866	14,428	22.0	32.2	....	35.1	29.1
1867	14,451	21.4	31.2	....	34.5	28.6
1868	13,856	20.0	29.0	....	32.5	27.0
1869	14,826	20.8	30.1	....	34.2	28.3
1870	14,721	20.2	29.0	....	33.4	27.6
1871	15,746	21.0	30.1	....	34.7	28.6
1872	16,142	21.0	30.0	....	34.6	28.5
1873	16,437	20.8	29.7	....	34.2	28.2
1874	15,564	19.2	27.3	....	31.6	26.0
1875	13,663	16.5	23.4	52.5	27.0	22.2
1876	12,749	15.2	21.4	47.6	24.7	20.3
1877	12,758	14.9	21.1	46.3	24.3	20.0
1878	12,893	14.9	20.9	45.6	24.1	19.9
1879	13,802	15.7	22.0	47.5	25.3	20.9
1880	15,538	17.4	24.4	52.2	27.9	23.2
1881	16,768	18.4	25.8	54.9	29.6	24.4
1882	17,684	19.1	26.6	56.6	30.6	25.2
1883	18,194	19.3	26.8	56.8	30.8	25.4
1884	17,333	18.1	25.0	52.9	28.8	23.7
1885	17,052	17.5	24.1	50.9	27.8	22.9
1886	18,018	17.8	24.7	51.7	28.5	23.5
1887	19,533	18.9	25.9	54.0	30.0	24.8
1888	19,739	18.6	25.4	52.6	29.4	24.4
1889	20,397	18.7	25.4	52.5	29.5	24.5
1890	20,838	18.6	25.2	51.8	29.4	24.5

The marriage rate of Massachusetts may also be said to be a barometer of prosperity. The fluctuations in the marriage curves correspond very strikingly with the rise and fall in industrial, commercial, and financial prosperity. Carroll D. Wright, United States Commissioner of Labor, enumerates the following industrial depressions as having occurred in the United States since 1850: (1) that of 1857, ushered in by financial disturbances; (2) the stagnation of business in 1867, being a slight reaction against the speculation following the close of the war; (3) the serious and prolonged depression of 1873–78; and (4) the depression of 1882–86.* It is a striking fact that the decline in the Massachusetts marriage curve is generally coincident with the years thus marked by industrial depression, and it is almost literally true that we can distinguish on her marriage curve the effect of the principal changes in her economic condition. The year 1878 marked the close of the longest and most severe industrial depression in the history of Massachusetts, and the marriage rate for that year was the lowest recorded since registration began in 1839.

It may be urged that it is merely by chance that the decline in the rate in Massachusetts corresponds with these periods of industrial depression. There are fairly accurate marriage returns for the States of Vermont, Rhode Island, Connecticut, Ohio, Maryland, and Michigan, since 1870, and the uniformity with which a low marriage rate occurs in these States during the two periods of industrial stagnation, 1873–78 and 1882–83, is strong proof of the close relation of marriage and prosperity, and a sufficient answer to the objection that Massachusetts may be an exceptional State.

The highest marriage rate recorded in Massachusetts was reached in 1854, and the rate steadily and rapidly declined from 1854 to 1858, when an upward movement began which was suddenly checked in 1860 by the outbreak of the Civil War. During the registration year, 1861, "there were

* First Annual Report of the Commissioner of Labor, 1886, pp. 56–64.

absent for a greater or less part of the year, beginning with April, no less than 33,636 soldiers and 11,000 sailors."* Of these, about 30,000 were enlisted for three years. There was also a considerable falling off in the number of marriages solemnized, though undoubtedly the celebration of some was hastened by the outbreak of war and the departure of the troops.† The rate continued to decline slowly in 1862 and 1863. In 1864 there was an increase of 1640 in the number of marriages celebrated in the State. This sudden increase has never been explained. Probably it was due in part to the return of some of the men whose three-year terms had expired, but perhaps a stronger influence may be found in the fact that the people were becoming more hopeful and confident of the final outcome of the war.

As the outbreak of war causes a depression in the marriage rate by disturbing business, making calculation of the future difficult and uncertain, and engaging large numbers of men of marriageable age in military duties, so the termination of war is marked by a sudden increase in the number of marriages, due partly to the celebration of postponed marriages, and partly to the renewal of industry and commerce.

A study of the diagram shows that at the close of any period of calamity the marriage rate takes a sudden upward bound. While this sudden upward movement is more marked at the end of the Civil War, yet the phenomenon recurs at the close of the periods of industrial and financial depression.

The general trend of the marriage curve for Massachusetts, 1850–90, is downward, and the downward movement is more marked when the number of marriages is compared with the adult population than when the rate is estimated on the basis of the whole population. Comparing the rates

* Massachusetts Registration Report, 1861, p. 3.

† In 1862, August stood next to November in the number of marriages contracted. This was a striking exception to the general rule, August being a month when very few marriages are celebrated. Possibly the explanation of this phenomenon is to be found in the fact that in the months of August and September eight regiments marched and 16,000 nine-months men were recruited. *Massachusetts Registration Report*, 1862, p. 15.

of 1850 and 1890, there was a decline of 10.5 per cent in the crude rate, and of 16.92 per cent in the rate based upon the adult population.

This difference may be partly explained by the fact that the age constitution of the population has been changing. The population of marriageable age has increased faster than the total population, and in 1890 this element of the population formed a per cent of the total 5.26 larger than in 1850. The following table will show the changes: —

TABLE II.

PER CENT OF THE TOTAL POPULATION OF MASSACHUSETTS AGED 15 AND ABOVE.

Years.	Per Cent of Adults to Total Population.	Years.	Per Cent of Adults to Total Population.
1850	68.32	1875	70.58
1860	67.98	1880	71.27
1865	68.90	1885	72.36
1870	69.46	1890	73.58

An examination of Table No. 1, or of the diagram, will show that while in 1850 there were 30 persons who annually married in every 1000 of the adult population, in 1890 there were only 25 persons marrying in every 1000 adults; and the conditions at these two dates, 1850 and 1890, are not exceptional, but represent fairly the general trend of the rate. This decline in the marriage rate seems to indicate that permanent single life, or at least a postponement of marriage, is becoming more general in Massachusetts. We have census data upon the conjugal condition of the population of Massachusetts for 1875, 1885, and 1890. The following table gives the facts for the three censuses containing such information: —

TABLE III.

Years.	Adult Population.	Married Population.	Per Cent Married Among Adults.
1875	1,165,954	645,245	55.34
1885	1,405,410	739,586	52.62
1890	1,647,379	843,205	51.18

This table indicates that the percentage of the adult population living in a married state was 4.16 less in 1890 than in 1875, which is a somewhat remarkable decrease for an interval of only fifteen years.

How are this decline in the marriage rate and increase of single life brought about? We know that men and women intermarry at all ages, but statistics show that the great majority of marriages are those contracted by bachelors and maidens aged between 20 and 30 years. Now, it would be very instructive to know whether the decline in the marriage rate has been brought about by the temporary abstention from marriage of certain persons in all the age groups, or whether the decline has been effected mainly by a temporary abstention from marriage on the part of young adults. Some light is thrown upon the question by the average age at which people marry for the first time. The Registration Reports give the average age of all the bachelor grooms and the average age of all the maiden brides, for each year, beginning with 1864. The following table shows the changes: —

TABLE IV.

AVERAGE AGES AT MARRIAGE.*

Years.	Average Age of Bachelor Grooms.	Average Age of Maiden Brides.	Year.	Average Age of Bachelor Grooms.	Average Age of Maiden Brides.
1864	27.0	**30.7**	1878	26.5	23.8
1865	26.4	22.8	1879	26.7	23.9
1866	26.4	23.6	1880	26.5	23.8
1867	26.6	23.6	1881	26.5	23.9
1868	26.5	23.6	1882	26.5	23.9
1869	26.4	23.7	1883	26.6	23.4
1870	26.3	23.6	1884	26.6	24.1
1871	26.3	23.5	1885	26.8	24.2
1872	26.3	23.4	1886	26.9	24.2
1873	26.3	23.5	1887	26.8	24.4
1874	**26.2**	23.6	1888	26.8	24.4
1875	26.3	23.6	1889	26.9	**24.5**
1876	26.5	23.7	1890	**27.2**	24.3
1877	26.4	23.8			

* For averages from 1871 to 1890, inclusive, see 49th Registration Report, p. 245.

In 1864 the average age of bachelor grooms, it appears, was 27 years; of maiden brides, 20.7 years; in 1890 the average age of bachelor grooms was 27.2, and of maiden brides, 24.3 years. From a study of the average ages for the years since 1870, it would seem that there has been an increase of about six months in the average age of the bachelor grooms, and an increase of about eight months in the average age of the maiden brides.

In 1890, 18,085 bachelors were married, their ages being on the average six months more advanced than that of the bachelors marrying in 1850. Here is a loss of 9042 years of married life, so far as bachelors are concerned; 19,084 maidens were led to the altar in 1890, on the average older than the maidens who married in 1850 by eight months. Here is a loss of married life among the maidens of Massachusetts amounting to 12,273 years of wedded life, reckoned on the basis of one couple. The question then arises, is this retardation of first marriages most marked among young adults?

The censuses of 1870, 1875, 1880, 1885, and 1890 distinguish the number of males aged 20–25, and these censuses, together with those of 1850 and 1860, give the number of females aged 15–19. The Registration Reports furnish data in regard to the number of males and females who marry respectively in these age groups. By combining these data, as has been done in the tables below, we can determine for each sex whether or not marriage, at these earlier ages, has been declining.

The number of females aged 15–19 who marry, as compared with the total number of females at that period of life, seems to have declined very considerably since 1850, and the same has been true as regards the males aged 20–25 for the period since 1870.

The decline in marriage is by no means confined to Massachusetts. The other States of the Union for which we have reliable statistics almost uniformly show a decline in

TABLE V.

PROPORTION OF FEMALES, AGED 15–19, WHO MARRIED IN MASSACHUSETTS, 1850–90.

Year.	Female Population Aged 15–19.	Number of Such Females Marrying.	Number per 1000.	Year.	Female Population Aged 15–19.	Number of Such Females Marrying.	Number per 1000.
1850	56,592	2,253	39.8	1871	76,500	3,219	42.1
1851	57,315	2,778	48.5	1872	78,971	3,370	42.7
1852	58,038	2,721	46.9	1873	81,442	3,380	41.5
1853	58,760	2,969	50.5	1874	83,913	3,211	38.3
1854	59,482	3,104	**52.2**	1875	86,384	2,747	31.8
1855	60,204	2,715	45.1	1876	86,569	2,454	28.4
1856	60,926	2,739	45.0	1877	86,754	2,440	28.1
1857	61,648	2,609	42.3	1878	86,939	2,394	**27.5**
1858	62,370	2,326	37.3	1879	87,124	2,510	28.8
1859	63,092	2,474	39.2	1880	87,309	2,695	30.9
1860	63,814	2,683	42.0	1881	89,239	2,821	31.6
1861	64,836	2,552	39.4	1882	91,169	2,987	32.8
1862	65,858	2,501	38.0	1883	93,099	2,953	31.7
1863	66,880	2,191	32.8	1884	95,030	2,958	31.1
1864	67,902	2,437	35.9	1885	96,961	2,831	29.2
1865	68,923	2,485	36.1	1886	99,733	2,996	30.0
1866	69,944	2,778	39.7	1887	102,505	3,169	30.9
1867	70,965	2,877	40.5	1888	105,278	3,218	30.6
1868	71,986	2,633	36.6	1889	108,051	3,185	29.5
1869	73,007	2,920	40.0	1890	110,824	3,286	29.7
1870	74,028	2,924	39.5				

TABLE VI.

PROPORTION OF MALES, AGED 20–24, WHO MARRIED IN MASSACHUSETTS, 1870–90.

Year.	Male Population Aged 20–24.	Number of such Males Marrying.	Number per 1000.	Year.	Male Population Aged 20–24.	Number of such Males Marrying.	Number per 1000.
1870	66,400	5,625	84.71	1881	85,957	6,195	72.07
1871	68,226	6,156	90.23	1882	87,245	6,717	76.99
1872	70,052	6,448	**92.61**	1883	88,533	6,708	75.77
1873	71,878	6,564	91.32	1884	89,821	6,427	71.55
1874	73,704	5,946	80.67	1885	91,109	5,968	65.50
1875	75,529	5,280	69.91	1886	96,043	6,328	65.88
1876	77,357	4,813	62.22	1887	100,977	6,903	68.36
1877	79,185	4,855	61.31	1888	105,910	7,039	66.46
1878	81,013	4,797	59.21	1889	110,843	7,279	65.67
1879	82,841	4,853	**58.60**	1890	115,776	7,516	64.92
1880	84,668	5,779	68.25				

the crude marriage rate. The decline has been very rapid in Rhode Island and Ohio, and is very evident in Vermont,

Connecticut, Maryland, and Michigan.* Nor is the phenomenon of a declining marriage rate peculiar to the United States. The statistics of most European countries reveal a downward movement since 1870.

The following table shows the crude marriage rate of the State of Massachusetts and of the various foreign countries for the last four quinquennial periods† : —

TABLE VII.
CRUDE MARRIAGE RATE BY QUINQUENNIAL PERIODS.

Countries.	1871-75.	1876-80.	1881-85.	1886-90.
Italy	15.6	15.1	16.1	15.6
Prussia	18.9	15.9	15.9	16.2
France	16.9	15.2	15.0	14.4
Belgium	15.0	13.8	13.7	14.1
Switzerland	16.0	14.8	13.7	14.1
Austria	18.3	15.5	15.8	15.4
Sweden	14.5	13.2	12.8	12.3*
Norway	14.6	14.4	13.3	12.7
Denmark	15.9	15.6	15.0	14.1
Ireland	9.8	9.1	8.3	8.7
Scotland	15.0	13.8	13.8	13.0
England and Wales	17.1	15.3	15.2	14.8
Massachusetts	19.7	15.5	18.5	18.5

* 1886-89.

The table shows a decline in the marriage rate in every instance (excepting Italy), if comparison is made between the first and last periods.

The decrease in the marriage rate of England seems to have been brought about in part by the retardation of marriage, just as in Massachusetts. Dr. Ogle, in a paper read in 1890 before the Royal Statistical Society of London,‡ gives a table in which he contrasts the annual marriage rates for different ages, as computed in 1851 and in 1880-82: —

* The crude marriage rate of Michigan does not show a decline since 1870, but when the number of marriages is compared with the adult population, or the adult marriageable population, a decline is noticeable. The crude method has been employed in computing the rates of other States.

† The rates for the foreign countries have been calculated from the tables in the Registrar-General's Report, 1890, pp. lxiv-lxxiv.

‡ Marriage Rates and Marriage Ages, *Journal of the Royal Statistical Society*, 1890, p. 253.

"In this interval of thirty years the marriage rate fell from 17.2 to 15.2; but the table shows that this decline was entirely brought about, so far as bachelors are concerned, by a decline in the marriages of those between 20 and 25 years of age, and that bachelors older than this actually married at the later date in higher proportions than before; and something of the same kind is visible, though not quite so distinctly, in the case of the widowers, the spinsters, and the widows,— that is to say, in each of these groups the decline in the marriages was less in the advanced than in the earlier ages, and indeed in the very advanced ages the rate in all cases rose." (Page 272.)

From data contained in the State censuses of 1875 and 1885, and from figures of the Eleventh Census obtained by the courtesy of Hon. Carroll D. Wright, I have been able to compute the marriage rates of Massachusetts since 1875, in the four classes distinguished by sex and conjugal condition, as bachelors, spinsters, widowers, and widows.* In computing these special marriage rates I have compared the number of each class marrying with the population of each class respectively, eliminating all the population under 15 years. The results of this computation show very clearly that matrimonial projects, whether they be those contemplated by bachelors, maidens, widowers, or widows, are all affected by industrial depressions. The depression of 1882 to 1886 caused a downward movement in all the rates. A comparison of these rates brings out some interesting facts. A widower or divorced man has had on the average, during this period (1875–90), about five times as good a chance of re-marrying as a widow or divorced woman. Roughly compared, the chance that a bachelor will marry is to the chance that a widower will re-marry as 55 is to 75. On the other hand, the chance that a maiden will wed is more than three times as great as the chance that a widow will re-marry. All these conclusions, however, would be materially modified if our data enabled us to allow for the varying influence of age in each class.

* See Tables VIII and IX.

TABLE VIII.

MARRIAGE RATES OF BACHELORS AND WIDOWERS AGED 15 AND UPWARD IN MASSACHUSETTS, 1875–90.

Year.	Number of Bachelors Aged 15+.	Number of such Bachelors who Married.	Number per 1000.		Number of Widowers and Divorced Males Aged 15+.	Number of such who Married.	Number per 1000.	
1875	206,905	11,344	54.83	Depression.	21,718	2,298	**105.81**	Depression.
1876	212,594	10,490	49.34		22,878	2,244	98.09	
1877	218,283	10,523	48.21		24,038	2,214	92.10	
1878	223,972	10,622	**47.43**		25,198	2,244	89.05	
1879	229,661	11,459	49.90		26,358	2,321	88.06	
1880	235,350	13,121	55.75		27,518	2,400	87.22	
1881	241,039	14,183	58.84		28,678	2,575	89.80	
1882	246,727	14,977	**61.70**		29,838	2,689	90.12	
1883	252,415	15,357	60.84		30,997	2,835	91.50	
1884	258,103	14,713	57.00	Depression.	32,156	2,614	81.30	Depression.
1885	263,791	14,495	55.00		33,315	2,553	76.63	
1886	277,165	15,456	55.76		34,046	2,553	74.99	
1887	290,539	16,719	57.55		34,777	2,808	80.74	
1888	303,913	17,035	56.05		35,508	2,702	76.10	
1889	317,288	17,583	55.42		36,239	2,812	77.60	
1890	330,665	18,085	54.69		36,969	2,709	**73.28**	

TABLE IX.

MARRIAGE RATES OF MAIDENS AND WIDOWS AGED 15 AND UPWARD IN MASSACHUSETTS, 1875–90.

Year.	Number of Maidens.	Number of Maidens who Married.	Number per 1000.		Number of Widows and Divorced Females.	Marriages of Widows and Divorced Females.	Number per 1000.	
1875	216,593	12,114	55.93	Depression.	75,642	1,528	**20.20**	Depression.
1876	222,299	11,227	50.50		78,002	1,507	19.32	
1877	228,005	11,311	49.61		80,401	1,426	17.74	
1878	233,712	11,427	**48.90**		82,780	1,439	17.38	
1879	239,419	12,360	51.62		85,159	1,420	16.67	
1880	245,126	13,956	56.93		87,538	1,565	17.88	
1881	250,833	15,177	60.51		89,917	1,585	17.58	
1882	256,540	15,956	62.20		92,296	1,710	18.53	
1883	262,247	16,357	**62.37**		94,675	1,835	19.38	
1884	267,954	15,624	58.31	Depression.	97,054	1,703	17.55	Depression.
1885	273,661	15,397	56.26		99,433	1,651	16.60	
1886	284,200	16,367	57.59		101,534	1,642	16.17	
1887	294,739	17,710	60.06		103,635	1,817	17.53	
1888	305,278	17,948	58.80		105,735	1,789	16.92	
1889	315,817	18,440	58.39		107,835	1,955	18.31	
1890	326,356	19,804	58.48		109,935	1,750	**15.92**	

Another fact worthy of attention, but which I am unable to explain, is that the marriage rate of widowers has declined during the past twenty years much more rapidly than the other rates.

Marriage Rates in Urban and Rural Districts Compared.— The crude marriage rate seems to be considerably higher in the urban than in the rural districts of Massachusetts. In 1890, 61.3 per cent of the total population were inhabitants of twenty-eight cities having a population above 10,000. Comparison may be made of the marriage rates in these cities and in the State outside the cities.

The following table gives the number of persons marrying per 1000 population in the Massachusetts cities and rural districts for five census years: —

TABLE X.*

Year.	28 Cities.	Rural Districts.†
1870	23.6	16.8
1875	18.4	14.2
1880	18.0	15.2
1885	19.2	15.0
1890	20.4	15.6

* For this table see Registration Report, 1890, pp. 372-3.
† By rural is meant the State, excepting the 28 cities.

On the average, the rural part of the State shows a marriage rate smaller than the urban districts, by two marriages per 1000 population. The table shows also that the decline in the marriage rate has been greater in the urban than in the rural districts. In reply to this it might be argued that a larger number of marriages is natural when the proportion of young adults is greater, as it probably is in cities. But when we proceed to examine the proportion of adults in cities, it appears from the following table that there is no considerable difference between the urban and rural population of Massachusetts in this respect: —

TABLE XI.

PROPORTION OF ADULT POPULATION IN URBAN AND RURAL DISTRICTS OF MASSACHUSETTS, 1885.*

	Rural Districts.	Cities.
Total population	854,645	1,087,496
Population over 15	618,930	786,480
Per cent of Adults	72.42	72.32

* See Massachusetts Registration Report for 1885, p. 32.

Comparing the marriage rates of city and country as computed either on the basis of the adult population or on the basis of the adult marriageable population, the urban rates are higher than the rural. The table given below shows the conditions as revealed by the census of 1885: —

TABLE XII.

MARRIAGE RATES IN CITY AND COUNTRY IN 1885.

	Rural Districts.	Cities.
Adult population	618,930	786,480
Adult marriageable population	265,092	385,748
Per cent of adult marriageable population	42.83	49.05
Number of marriages	6,435	10,617
Rate based on adult population	10.40	13.50
Rate based on adult marriageables	48.52	55.05

In 1885 the adult persons unmarried — that is, the bachelors, spinsters, widowers, widows, and the divorced, aged over 15 years — formed a considerably larger element of the urban than of the rural population, the difference being 6½ per cent. On whatever basis we compute the marriage rate of Massachusetts, the urban rates are considerably higher than the rural. M. Levasseur points out that urban populations generally have a larger proportion of adults, and consequently of individuals capable of marrying, than the rural populations. While it is very generally remarked, says Levasseur, that the crude marriage rate is higher in the cities than in the country, in reality, comparatively to the number of adults, there are fewer marriages in the city than

in the country.* In Massachusetts, however, the urban rates seem to be highest, even when the comparison is made on the basis of the adult population.

By adult, M. Levasseur means those aged from 15 to 60 years. He thus eliminates the very old from his divisor in estimating his marriage rates. It is possible, and indeed quite probable, that in Massachusetts, as in France, the very old (those 60 and upward) form a smaller element of the total population in the cities than they do in the rural districts. If this is true, then the cities of Massachusetts may contain a larger proportion of adults aged 15–60 than do the rural districts, and the difference may be such that the marriage rates in the cities computed on this basis would be smaller than the rural rates. The censuses, State or national, do not give data as to the number of persons aged 60 and upward. I have therefore been obliged to content myself with the total population aged 15 and above.

* Levasseur, *La Population Francaise* vol. 2, pp. 77, 392.

RECENT CONTRIBUTIONS TO VITAL STATISTICS.

By Gaby N. Calkins.

Die Selbstmorde in Wien während der Jahre 1854–94. By Bratassivic, in *Statistische Monatschrift*, Jg. xxi, Hft. 5.

This interesting paper on suicides in Vienna is worthy of careful study. The limited territory covered and the accurate German statistical methods make the results valuable and the conclusions safe. An important series of tables gives the number of suicides, sex, and form of death from 1854–1894 (Table A); a classification by ages in five-year periods (Table B); the civil status of suicides according to sex (Table C); a division according to confession and sex (Table D); a division according to domicile and sex (Table E); the facts and motives of suicide (Table F); the period of year (Table G); and finally Tables H and I give the kind of suicides and the calling or profession.

1. The first lesson to be drawn from the study is that suicides in Vienna occur with no regularity from year to year. In 1871 suicides began to increase rapidly but irregularly, until in 1894 there were more than twice as many as in any year previous to 1864, and this rate of increase has been greater than the rate of increase of the population. By five-year periods suicides occurred as follows: —

	Increase per Cent.		Increase per Cent.
1854-58	....	1874-78	61.6
1859-63	1.9	1879-83	10.6
1864-68	54.0	1884-88	6.0
1869-73	11.7	1889-93	4.8

This shows an increase of suicides in the five years 1889–93 over the quinquennium 1854–58 of 248.3 per cent, or more than three times, while the population of Vienna increased only by 74.2 per cent.

2. Relation of suicides to total deaths and to the population of Vienna: —

	Suicides per 10,000 People.	Percentage of Suicides to Total Deaths.
1854-58	1.53	0.36
1859-63	1.41	0.41
1864-68	1.97	0.56
1869-73	1.90	0.56
1874-78	2.95	0.99
1879-83	3.20	1.07
1884-88	3.15	1.15
1889-93	3.07	1.27

The last column shows the effect of increased population upon the rate of suicides.

3. Relation of suicides in different parts of Austria.— In all of these there is a constant increase of suicides from one quinquennium to another. In many cases the increase is often more than 100 per cent, but in nearly all cases the increase is slighter in the later quinquennia. This decrease in the rate is less in Vienna, however, than in any other province of the kingdom. The percentage of suicides to total deaths is nearly twice as great in Lower Austria (including Vienna) as in Austria as a whole.

4. Relation of suicides to sex.— Suicide among women has not increased as rapidly as among men.

5. Suicides by ages.—The greatest number of suicides occurs in the age period 21–25 years; the next greatest in the period 26–30 years; and the third greatest in the age period 16–20 years.

Number of Suicides for every 10,000 People of Same Age Periods.

	1869.	1880.	1890.
Until 20	1.70	3.77	1.60
20-30	5.39	4.31	3.25
30-40	5.36	5.76	2.06
40-50	2.32	2.20	2.56
50-60	3.46	3.25	3.37
60-70	2.46	0.29	2.16
70-80	1.98	1.77	2.12
After 80	5.20	1.00	11.22

6. The civil status of suicides.—This can best be shown by the following tabular summary: —

	1869.			1880.			1890.		
	Men.	Women.	Total.	Men.	Women.	Total.	Men.	Women.	Total.
Single.....	4.74	2.00	3.43	4.18	1.01	2.55	3.17	1.31	2.22
Married....	4.69	1.24	2.94	6.24	1.24	3.73	4.59	1.18	3.06
Widowed...	10.18	1.75	3.79	12.89	1.66	3.92	8.95	1.32	2.99
Divorced...	2.69	2.04	2.32	2.07	....	0.98	2.93	2.40	2.60

7. Creed of suicides.—This also is shown by a condensed table: —

	1869.	1880.	1890.
Catholics.....	2.60	3.12	2.61
Evangelists.....	3.20	3.99	0.99
Greek Oriental....	4.62	7.23	5.09
Israelites.....	2.30	2.34	2.46

8. The seasonal distribution of suicides, 1869–94: —

January.....	8.5	July.....	8.1
February.....	7.6	August.....	7.2
March.....	8.9	September.....	7.4
April.....	9.1	October.....	8.3
May.....	10.5	November.....	7.8
June.....	8.7	December.....	7.9

The maximum numbers of suicides for all quinquennia since 1854 are in May and March, while the minimum numbers are in February, December, September, and October.

9. The causes and motives of suicide.—In only about 39 per cent of all suicides could the motives be ascertained. These are shown in the following table: —

Motive.	1869-73.	1874-78.	1879-83.	1884-88.	1889-93.
Tired of life.....	6.02	1.96	1.32	1.17	1.91
Dementia.....	10.14	3.72	6.81	5.27	5.13
Melancholia.....	4.44	0.98	1.41	0.92	2.59
Incurable disease.....	6.34	4.41	5.58	6.79	8.71
Unrequited affection.....	11.41	7.15	4.69	4.76	6.30
Drunkenness.....	2.53	1.47	1.89	0.92	0.74
False sense of honor.....	1.26	1.17	0.38	0.25	0.49
Fear of punishment.....	4.12	1.47	0.62	0.66	1.78
Grief.....	1.42	1.07	0.44	0.16	0.31
Family discord.....	4.12	3.23	1.77	1.08	1.61
Business troubles.....	13.63	16.56	13.37	6.43	5.99
Unknown.....	34.57	56.81	61.72	71.59	64.44

10. Form of suicide, 1854–94: Hanging, 32.5; shooting, 23.5; poison, 22.4; fall from height, 8.1; stabbing and cutting, 6.1; drowning, 5.8; run over, 0.4; all other forms, 1.2.

This represents the average for the period 1854–94. Shooting has greatly increased in recent years, while daggers and knives have gone out of fashion. Hanging also has declined, while poison has increased; 37 per cent of male suicides were by hanging and 14.8 per cent by poison. For females, however, only 18.3 per cent were by hanging, while 47.7 per cent were by poison; 29.6 per cent of suicides were by shooting, for males, and only 3.1 per cent for women.

Age also has much to do with the method of disposing of one's self. Thus, hanging is the most acceptable method for men of the age period 26–30 years. Other methods, such as drowning and drinking, seem to be evenly distributed for all ages.

11. Calling or profession of suicides.—The paper ends with a discussion regarding the occupations of the suicide, from which the following are taken: —

Bakers, butchers, policemen, watchmen, etc.,	1.2	per cent	of	all suicides.
Advocates, doctors of law, etc.,	1.3	"	"	"
Stone and brick layers, plasterers, etc.,	1.4	"	"	"
Gold and silver workers,	1.5	"	"	"
Agents (real estate, insurance, etc.),	1.6	"	"	"
Weavers of fabrics,	1.7	"	"	"
In household service as butlers, etc.,	1.8	"	"	"
Without work or employment,	2.1	"	"	"
Students,	2.3	"	"	"
Coachmen, car drivers, hack drivers, etc.,	2.4	"	"	"
Hotel keepers and restaurant proprietors,	2.5	"	"	"
Tailors,	2.6	"	"	"
Carpenters, joiners, etc.,	2.7	"	"	"
Shoemakers,	2.9	"	"	"
Private servants as valets, gardeners, etc.,	4.1	"	"	"
Day laborers of various kinds,	4.2	"	"	"
House servants,	4.5	"	"	"
Private citizens,	4.9	"	"	"
Trades-people,	6.1	"	"	"

In the following table the figures represent the number of suicides per 10,000 people in any given occupation: —

Public officials ...	5.8	Gold and silver smiths	4.9
Private "	14.9	Locksmiths.....	3.8
Students.....	3.5	Cabinet makers.....	2.5
Tradesmen.....	24.2	Bakers.....	3.6
Lawyers	7.9	Shoemakers.....	2.7
Innkeepers.....	3.1	Day laborers.....	9.3

Ueber den gegenwärtigen Stand der Kindersterblichkeit, ihre Erscheinungen und ihre Entwickelung in europäischen Grossstädten. By Dr. Silbergleit, in *Hygienische Rundschau*, 1895, No. 5.

The instability of the population in large cities makes it difficult to establish accurate statistics of mortality for adults. As a basis for comparison, accurate statistics of at least one age period should be obtained, and Dr. Silbergleit holds that infant mortality offers such a basis.

The different countries of Europe may be arranged as follows in respect to the ratio of infant mortality to total living born: Ireland, Norway, and Sweden, with 10 per cent; then follow Denmark, Greece, Finland, England and Scotland, France, Belgium, Italy, Switzerland, Roumania, Netherlands, Prussia, Baden, Wurtenburg, Austria, Bavaria, and Saxony, in the order given. The lowest rate, therefore, is in the northwest of Europe. The greatest mortality is in European Russia, where the percentage to all living born is 29.6.

Country.	Period.	Living Births per 1,000.	Percentage of Illegitimates.	Death Rate in First Year per 1,000.
Ireland.....	1871-80	25.9	2.4	9.7
Norway.....	1889-91	30.3	7.1	10.1
Sweden.....	1888-90	28.1	10.2	10.4
Denmark.....	1887-89	31.7	9.4	13.7
Greece.....	1871-80	28.1	1.3	13.8
Finland.....	1888-90	33.5	6.5	14.4
England and Scotland.	1871-80	35.2	6.7	14.5
France.....	1872-80	25.6	7.2	16.6
Belgium.....	1891-92	29.1	8.8	16.6
Italy.....	1891-92	36.9	7.0	18.5
Switzerland.....	1871-80	31.2	4.7	19.4
Roumania.....	1871-80	41.9	4.5	19.7
Netherlands.....	1871-80	36.4	3.2	20.3
Prussia.....	1890-92	36.8	7.6	20.7
Baden.....	1890-92	33.3	8.5	22.2
Wurtenberg.....	1890-92	35.7	10.2	25.3
Austria.....	1890-92	37.0	14.9	25.4
Bavaria.....	1890-92	35.4	14.4	27.4
Saxony.....	1890-92	40.5	12.3	28.1
European Russia.....	1871-79	49.1	2.9	29.6

History shows (see Westergaard) that the infant mortality in Sweden in the last century was double the present figure. Almquist asserts that in the last twenty-five years of the eighteenth century the rate in Finland was 37 per cent of all living births; now it is 14.4 per cent.

The author, while admitting the possibility of error of registration returns, etc., maintains that enough evidence is gained to establish certain facts. For example, thirty-three of the English cities having each a population of more than 80,000 have an average infant mortality of 16.3 per cent in the period 1888–92. In the same period the German cities, each having more than 15,000 inhabitants, and fifty-seven Austrian cities each having a population of more than 12,000, have infant mortality percentages of 23.7 and 23.9 respectively. In twenty-nine of the largest cities of Hungary the percentage rises to 25.7. The following table shows the rate of infant mortality in some of the largest cities of Europe: —

	Percentage of Deaths Under 1 Year.			
	1891-93.	1888-90.	1885-87.	1882-84.
Dublin	17.5	17.1	18.1	19.0
Edinburgh	13.9	13.4	13.1	12.8
London	15.8	15.1	15.5	15.1
Manchester	19.1	18.0	18.3	17.9
Christiana	15.5	16.9	16.3	16.4
Copenhagen	19.2	19.9	20.1	22.2
Moscow	36.1	....	....	....
Magdeburg	25.8	25.5	24.6	26.0
Berlin	24.7	25.7	26.7	28.5
Chemnitz	35.4	35.5	35.9	36.6
Leipzig	24.4	21.5	22.2	26.4
Frankfurt	16.7	17.1	18.5	18.1
Amsterdam	17.6	18.9	19.0	20.9
Paris	13.5	14.1	14.0	14.9
Malaga	25.9	26.4	25.9	26.1
Turin	14.5	13.5	14.3	14.5
Vienna	21.6	19.4	20.5	20.0
Bucharest	24.1	25.4	26.7	29.9

The differences here are quite variable, and Dr. Silbergleit attempts to find some explanation of them. He finds that illegitimacy is no great factor, as may be shown by the following comparison of illegitimate births and deaths with the rates for legitimates: —

	Percentage of Living Born.			
	Total Illegitimate Births.	Total Death Rate 1 Year.	Legitimate Death Rate.	Illegitimate Death Rate.
Barmen	3.4	15.6	14.8	39.7
Elberfeldt	4.1	15.6	14.7	36.7
Aachen	4.1	26.3	25.2	50.9
Duseldorf	5.2	21.0	19.8	42.5
Krefeld	4.5	21.0	20.3	36.7
All Prussian cities	8.9	22.2	20.6	39.1
All Prussian country	6.8	19.8	18.8	33.6
All Prussia	7.6	20.7	19.5	36.0
Budapest	28.3	20.8	19.2	25.1
Stockholm	28.1	15.6	10.6	25.0

He considers the birth frequency a potent factor, for amongst the poorer classes, where the birth rate is the greatest, the death rate is also the greatest. This is shown by Liverpool and Manchester, and other great manufacturing cities of Europe. In Swiss and in French cities where the number of births is the lowest, the number of infant deaths is also the lowest in proportion to the living born. This factor, however, cannot account for all of the variations, the most important factor being, according to Silbergleit, the climatic relations. With increase of temperature the infant mortality also increases, as the following table will show: —

	Infant Mortality. Percentage by Quarters.				
	1st.	2nd.	3rd.	4th.	Total.
Glasgow	25.2	25.2	24.0	25.6	100.0
London	25.3	21.5	29.6	23.6	100.0
Manchester	22.4	24.0	29.4	24.2	100.0
Stockholm	26.2	23.5	29.5	20.8	100.0
Moscow	18.9	32.7	30.9	17.5	100.0
Magdeburg	18.1	21.6	43.2	17.1	100.0
Berlin	21.0	25.2	34.7	19.1	100.0
Chemnitz	20.7	25.2	34.6	19.5	100.0
Leipzig	16.7	19.8	46.2	17.3	100.0
Strassburg	20.0	25.7	36.1	18.2	100.0
Amsterdam	25.4	25.5	26.7	22.4	100.0
Brussels	24.4	22.7	31.4	21.5	100.0
Paris	25.0	25.3	28.2	21.5	100.0
Lyons	26.2	20.9	32.5	20.4	100.0
Rouen	24.5	22.9	32.2	20.4	100.0
Malaga	24.9	28.9	22.5	23.7	100.0
Rome	30.2	22.1	24.0	23.7	100.0
Turin	28.9	25.4	24.0	21.7	100.0
Geneva	20.1	23.4	33.7	22.8	100.0
Trieste	27.8	19.9	29.2	23.1	100.0
Vienna	23.6	28.1	27.0	21.3	100.0
Budapest	24.1	25.2	28.1	22.6	100.0

In the summer quarter the German cities are higher than any of the cities compared. The causes of the increase of mortality in these months are diseases of digestion.

The following table is of interest, as showing the comparison between rates of infant mortality in higher and lower classes. The military men are taken as the representatives of the higher classes :—

INFANT MORTALITY RATE PER 100 OF LIVING BORN.

City.	Military.	All Children.
Berlin.....	12.84	24.72
Breslau.....	14.29	28.25
Cologne.....	18.56	27.06
Magdeburg.....	15.69	25.13
Dantzig.....	13.68	26.60

Kindersterblichkeit im preussischen Staate, from *Zeitschrift des Kön. preussischen statistischen Bureaus*, Jg. 35, Heft 1 und 2.

The conditions of infant mortality in Prussia can be easily seen from the following table : —

	Still-Births per 1,000 Births.		Mortality Rate per 1,000 Living Born Children Under 1 Year of Age.			
			Before End of 1st Year.		After the 1st Year.	
	Males.	Females.	Males.	Females.	Males.	Females.
1875	47.0	39.6	163.3	138.2	226.4	192.8
1876	45.0	38.3	160.1	134.9	227.1	194.2
1877	45.0	36.2	147.7	124.6	212.0	181.2
1878	45.1	36.9	154.9	130.6	215.8	183.9
1879	44.8	36.6	150.8	127.4	215.2	185.4
1880	43.9	35.8	166.4	142.0	229.6	197.5
1881	43.3	35.8	149.3	127.9	216.3	187.3
1882	42.9	35.9	158.1	133.1	227.4	193.6
1883	42.7	35.6	157.1	133.9	224.3	193.6
1884	43.0	35.7	162.6	138.6	230.8	199.1
1885	43.3	36.0	151.5	128.7	220.4	190.6
1886	42.6	35.2	172.4	147.7	235.8	203.7
1887	42.3	35.3	151.1	128.8	212.1	182.5
1888	40.9	34.3	152.4	129.1	218.8	188.5
1889	40.2	33.6	155.6	132.7	224.0	193.4
1890	36.8	30.1	156.7	132.8	219.1	187.0
1891	36.4	29.7	156.9	131.8	221.5	187.7
1892	36.6	29.6	161.7	135.8	226.7	192.9
Average.....	42.3	35.0	157.1	133.3	222.4	190.8

Die Kindersterblichkeit Wiens in den letzten 25 Jahren, 1869–94, in the *Statistische Monatschrift*, Jg. xxi, Heft 7.

A great decrease of infant mortality has been noticed in Vienna during the last twenty-five years, although Vienna has always held a very good position amongst the other cities of Europe in this respect.

In infant mortality the first day and the first month of life are the most affected, and this is greater for illegitimate children than for legitimate. A comparison of illegitimate with legitimate children, after the first year of life, is untrustworthy, because the former are taken away from foundlings' homes, etc., by the mothers, or else are "farmed out." These facts are shown by table on following page.

The best record is shown by the city proper, probably because of the better sanitary conditions. The most unfavorable records are for the environs, where the great majority of mothers are laboring women, who have neither time nor money to care properly for their children.

Sterblichkeit nach dem Alter. By Thornton, in *Statistische Monatschrift*, Jg. xxi, Heft 7.

Five pages of solid tables, giving the percentages of deaths by ages to the total living population of Austria, offer exceptional advantages for the study of death rates.

The mortality of children one year of age and under, in the various provinces, varies from 42.06 per cent of males (Salzburg) and 32.26 per cent of females (Krain). Up to the age of five years the percentages are high, but constantly decrease, being about 8 per cent for children of two years, about 4 per cent for children of three years, 2.5 to 3 per cent for children of four years, and about 2.2 per cent for children five years old. The mortality of six-year-old children varies from 1 to 2 per cent, but from this age up to the age of thirty years the death rate is below 1 per cent. From this age until about forty-eight years it is about 1.5 to 2 per cent, and stands between 2 and 3 per cent until the age of fifty-eight years, after which it rapidly goes up to about 10 per cent in the seventieth year and 41.18 per cent in the ninetieth.

One very interesting point brought out by the tables is the relation of sex to the death rate. It is a well-known fact that about 105 male children are born to every 100 female. According to Thornton's tables, 35.24 per cent of all male children of one year of age

Period.	Average Number of Deaths of Infants in 1st month.		Average Number of Deaths of Infants in 1st Year.		Average Number of Deaths of Children Under 5 Years.		Ratio of Male Children who Die to 100 Female Deaths.					
							Under 1 Month.		Under 1 Year.		Under 5 Years.	
	Legitimate.	Illegitimate	Legitimate.	Illegitimate	Legitimate.	Illegitimate	Legitimate.	Illegitimate	Legitimate.	Illegitimate	Legitimate.	Illegitimate
1869-73	1,385	1,203	4,162	2,158	6,633	2,654	136	136	106	95	117	114
1874-78	1,202	1,114	3,689	1,932	6,267	2,333	134	136	111	98	112	118
1879-83	1,186	1,075	3,527	1,911	5,994	2,371	134	132	120	119	109	117
1884-88	1,207	975	3,606	1,802	5,753	2,232	136	131	123	123	114	119
1889-93	1,209	951	3,587	1,788	5,538	2,200	129	118	124	115	115	113

Infant mortality in the country regions of Austria, the environs of Vienna, and in Vienna proper, shows the following relations : —

Deaths to Every 1,000 Living Births.

Period.	Age.	Vienna.		Suburbs.		Total Austria.		Country Districts.	
		Legitimate.	Illegitimate.	Legitimate.	Illegitimate.	Legitimate.	Illegitimate.	Legitimate.	Illegitimate.
1869 to 1878	1 month	83	103	110	224	107	159	97	117
	1 year	253	184	313	601	285	384	257	288
	5 years	415	223	498	642	385	374	367	411
1879 to 1888	1 month	75	85	94	126	100	117	98	121
	1 year	236	154	289	438	268	298	243	307
	5 years	374	191	424	572	456	476	437	604
1890 to 1893	1 month	75	82	97	112	88	101	91	115
	1 year	224	154	287	287	253	266	234	311
	5 years	346	189	368	441	350	333	348	395

die, whereas only 28.36 per cent of female infants of the same age die, a difference of 6.88 per cent. This relation is maintained until the sixth year, as follows: —

DEATH RATE PER CENT OF ALL INFANTS OF THE SAME AGE UP TO 6 YEARS.

Ages.	Percentage of Males.	Percentage of Females.	Difference per Cent.
In 1st year.....	35.24	28.36	+6.88
" 2nd "	8.45	7.94	+ .51
" 3rd "	4.28	3.95	+ .33
" 4th "	2.84	2.73	+ .11
" 5th "	2.21	2.06	+ .15
" 6th "	1.37	1.41	− .04

From the age of six until about the forty-fifth year the female percentage of deaths is greater than the male, as may be shown by taking every fifth year: —

DEATH RATES IN PERCENTAGES OF TOTAL LIVING AT SAME AGE.

Ages.	Percentage of Males.	Percentage of Females.	Difference per Cent.
In 10th year.....	0.66	0.70	−0.04
" 15th "	0.36	0.51	−0.15
" 20th "	0.77	0.80	−0.03
" 25th "	0.82	0.83	−0.01
" 30th "	0.95	1.05	−0.10
" 35th "	0.96	1.05	−0.09
" 40th "	1.18	1.33	−0.15
" 45th "	1.48	1.28	+0.20
" 50th "	2.01	1.86	+0.15
" 55th "	2.52	2.21	+0.31
" 60th "	3.64	3.95	−0.31
" 65th "	5.03	5.21	−0.18
" 70th "	7.92	8.19	−0.27
" 75th "	11.59	11.97	−0.38
" 80th "	16.81	17.68	−0.87
" 85th "	27.61	27.97	−0.36

These differences are worthy of careful study and comparison with the causes of death in the different age periods.

Die Illegitimatät in Steiermark. By Dr. Otto v. Zwiedineck-Sudenhorst, in *Statistische Monatschrift*, Jg. xxi, Heft 4.

In this study in illegitimacy in relation to the average marriage age, Styria, a province in Austria, is taken as the basis for statistics which cover a period of more than 100 years, in which the conditions have remained about the same. The author's general conclusion is that illegitimacy is great if the marriage age is high, and low if the

marriage age is low; and that the morality of a country is not necessarily measured by the rate of illegitimate births. A comparison of legitimates to illegitimates gives no basis of morality. To find such a basis the author multiplies the number of illegitimate births to every 100 unmarried women of child-bearing age, by the percentage of the unmarried to all child-bearing women, and divides the product by the number of births for each 100 child-bearing women. Thus, $y = \frac{BC}{D}$ where y equals the morality (in figures); B the percentage of illegitimate births to unmarried women, C the percentage of unmarried to all child-bearing women, and D the percentage of births to all child-bearing women.

A continuous and great increase of illegitimate births has taken place since 1785, as shown by the following selections: —

From	1785-88	there were on an average					95.09	illegitimate to every 1,000 births.				
"	1794-96	"	"	"	"	"	86.89 (?)	"	"	"	"	"
"	1806-09	"	"	"	"	"	130.62	"	"	"	"	"
"	1815-19	"	"	"	"	"	168.75	"	"	"	"	"
"	1825-29	"	"	"	"	"	215.04	"	"	"	"	"
"	1835-39	"	"	"	"	"	244.34	"	"	"	"	"
"	1845-49	"	"	"	"	"	253.41	"	"	"	"	"
"	1855-59	"	"	"	"	"	286.70	"	"	"	"	"
"	1865-69	"	"	"	"	"	300.34	"	"	"	"	"
"	1875-79	"	"	"	"	"	243.66	"	"	"	"	"
"	1886-90	"	"	"	"	"	245.67	"	"	"	"	"

The author indicates a close connection between the number of marriages of one year and the number of illegitimate births occurring in the next year. A year of few marriages is followed by a year of increased illegitimacy, and *vice versa*.

The abolition of foundlings' homes and maternity hospitals did not result in stopping illegitimacy, but acted merely to drive women away from Styria into Lower Austria. This is ascertained by the amount of money paid annually by Styria to Vienna and Prague for shelter of pregnant women who had left Styria. The number of illegitimate births registered in Styria would not, therefore, indicate the immorality of the latter province.

The increase of illegitimacy has been much greater in the southern than in the northern portions. In the southern portions, peopled chiefly by Slavs, the number of illegitimates is four times as great as 100 years ago, although it has decreased during the last thirty years. In northern Styria, however, where the number of illegitimates is and always has been greater than in the southern parts (45.19 per cent in the former and 16 per cent of total births in the latter), the people are no more immoral than in the southern provinces, because of the later average marriage age, as shown by the following figures: —

MARRIAGE AGE AND ILLEGITIMACY IN STYRIA.

Province.	Period.	Percentages of Grooms of Different Ages.					Percentages of Brides of Different Ages.					Illegitimacy per 100 Births.
		Under 24 Years.	24–30 Years.	30–40 Years.	40–50 Years.	Over 50 Years.	Under 20 Years.	20–24 Years.	24–30 Years.	30–40 Years.	Over 40 Years.	
MURAU. (Upper Styria.)	1883-87	5.7	21.7	40.0	22.9	10.0	5.0	19.0	29.0	29.5	17.5	54.71
	1888-92	3.4	26.5	40.3	21.7	8.0	5.0	16.4	31.7	30.9	15.0	
GRÖBMING. (Upper Styria.)	1883-87	4.1	29.5	42.0	20.4	6.7	5.5	15.3	34.0	30.0	15.2	42.18
	1888-92	3.0	30.3	43.7	17.1	6.0	5.1	18.7	34.8	30.0	12.4	
RANN. (Lower Styria.)	1883-87	19.6	40.1	23.1	9.3	7.9	17.3	30.7	26.0	15.6	10.4	10.93
	1888-92	12.5	45.3	24.8	9.9	7.0	15.7	36.0	30.0	14.8	10.5	
LUTTENBERG. (Lower Styria.)	1883-87	20.5	41.3	23.1	7.5	7.6	7.7	25.0	33.7	24.6	9.0	11.35
	1888-92	14.0	42.5	24.0	10.4	9.0	6.8	24.4	36.8	19.7	12.3	

The author claims that the later development of puberty does not account for the lateness of marriage, but rather the higher "standard of life," education, ambitions, etc. The entire question, therefore, is not so much one of morality as it is dependent upon circumstances of location, environment, and social status.

La mortalité des enfants du premier age dans ses rapports, avec les habitations occupées par les nourrices. By Dr. F. Ledé, in the *Journal de la Société de Statistique de Paris.* 1895, No. 8.

In this rather diffuse paper Dr. Ledé shows that medical inspection of the habitations of nurses has had a certain effect upon the diminution of infant mortality.

Sterbefälle männlicher, mit der Herstellung bezw. dem Vertriebe alkoholischer Getränke berufsmässig beschäftiger Personen in Preussen, from *Zeit. des kön. preuss. stat. Bureaus,* Jg. 35, Heft 1 und 2, 1895.

The figures in the following table represent the number of males engaged in the liquor traffic, who died from various causes in the period 1884–93: —

Trade.		Old Age.	Apoplexy.	Delirium Tremens.	Suicide.	Accident.
Brewers.	Owners	22	38	1	17	6
	Managers	20	28	....	9	5
	Laborers	60	90	18	58	123
Distillers.	Owners	25	32	5	11	4
	Managers	10	17	1	3	8
	Laborers	44	24	2	4	34
Wine and Beer Merchants.	Wine dealers	5	15	....	2	2
	" agents	9	5	1	10	4
	Beer dealers	....	4	1	3	....
	" drawers	....	3	5	1	4
	" laborers	....	2	....	1	....
Hotel proprietors		1,371	1,610	258	405	257
Inn proprietors		246	211	50	96	58
Inn and hotel employes		4	21	2	22	23
Waiters		9	59	15	159	96
Cooks		14	8	....	6	8
Other servants		....	....	....	1	....

Deaths from apoplexy occur more frequently than from old age, and relatively more often in case of the owners than of the assistants. No wine dealer, cook, or servant, and only one wine agent, died from

delirium tremens, and only one owner of a brewery, but five distillers, many brewers (laborers), waiters, and a large number of hotel and inn keepers died of this disease. The social standing does not notably affect the deaths from these causes.

Registration Report of Rhode Island, 1893.

This excellent report is the forty-first since the beginning of registration of births, marriages, and deaths in Rhode Island. The important facts of past years are presented for comparison with similar facts in 1893, and the report is therefore valuable as a history of Rhode Island registration, as well as for the important items for the year considered. The tables, however, are entirely lacking in rates,— an unfortunate omission in an otherwise excellent report.

The proportion of male to female births for every year since 1863 is shown by counties. The proportion varies from 112.9 males to 100 females in 1865 to 105.8 males to 100 females in 1893. The difference in different counties is also of interest, the proportion in one year being as high as 142.1 to 100 in Bristol county. An unusual if not altogether new feature is the stress laid upon sex of decedents in comparison with births by sex. The following summary is sufficient to show this : —

	Mortality of Males to 100 Females.	Births of Males to 100 Females.
1863	102.2	105.8
1868	94.3	104.5
1873	95.5	108.6
1878	94.8	102.7
1883	99.5	101.4
1888	95.4	105.4
1893	103.8	103.3

Annual Registration Report of Ontario for the Year 1893.

The population of Ontario for the year 1893 is estimated from the natural rate of increase,— that is, the percentage increase of births over deaths. No account is taken of the changes effected by emigration and immigration.

The birth rate in 1893 was 19.8 per 1000, the highest rates being in the most recently-settled districts. Males to females were in the

proportion of 106.5 to 100, a ratio that has increased by slight increments during the last four years. The ratio of illegitimates was 13.6 per 1000 births.

The marriage rate was 7.1 per 1000. This is a slight decrease from the marriage rate of previous years. In the report marriages are classified by religious denomination and by ages as well as by season and locality.

The death rate, according to the method of estimating population, was 10.6 per 1000. The editor makes no apology for this rather incredible rate. In the comparative table given, Indiana, California, Michigan, and Ontario all have about the same death rate, and a rate which does not exceed 10.6 per 1000. If death rates, like men, are to be judged by the company they keep, we must consider that of the Ontario report unsafe, for the registration records of Indiana, California, and Michigan are notoriously inaccurate on account of the inadequate registration laws. It is estimated that the death rate in Michigan for 1893 (10.0 per 1000) should be increased by about 60 per cent, and the same estimation applied to the rate of Ontario would make the latter 16.9 per 1000, which probably would still be too low.

Zymotic diseases in Ontario continue to decrease, while constitutional, local, and developmental diseases increase.

Twenty-seventh Annual Report Relating to the Registry and Return of Births, Marriages, and Deaths in Michigan for the Year 1893.

The Michigan registration report for 1893 begins with the now customary annual appeal for better and improved methods of registration. About twenty pages are given to a discussion of the registration bill which was presented to the Michigan Senate in January, 1895, but which failed to become a law.

The editor devotes five pages to his reasons for using a method of estimating intercensal population that is everywhere considered unsafe and faulty. This journal has constantly urged the use of the geometrical method as opposed to the arithmetical, or method of average annual increase. The editor offers a table comparing the two methods for each year since 1868; and while the figures show plainly (especially in the early years) the supremacy of the geometrical method, he nevertheless adopts the other, because it "seemed preferable for the conditions

existing in Michigan." Conditions can never be such that the arithmetic method is preferable scientifically, and the geometrical method, if correct for one, is equally correct for all conditions, no matter whether the difference shown by the two methods is as low as 500 or as great as 50,000, the scientific error in both cases is equally great.

The tables are models of arrangement and convenience, and one regrets that such care and skill should have such inadequate registration to work upon. Long tables of comparative statistics running back to 1867, and the application of many of the most recent advances in statistical presentation, make the report, even as it stands, of value to students, while summaries and detailed tables make it interesting for the casual observer.

The following table gives a general summary of the movement of the population of Michigan for 1893 : —

	Rate per 1,000 of Population.			
	Marriages.	Births.	Deaths.	Excess of Births over Deaths.
1870	16.5	22.5	9.1	13.4
1875	17.4	22.7	8.5	14.2
1880	18.2	21.1	9.8	11.8
1885	17.0	22.6	8.9	13.7
1890	17.8	25.0	10.3	14.7
1893	17.4	21.6	10.0	11.6

Annual Report of the Registrar-General of Births, Deaths, and Marriages for 1894. South Australia.

The population of the colony of South Australia in 1894 was 347,720 ; the birth rate 30.49 per 1000 in the proportion of 106.67 males to 100 females. The percentage of illegitimate to total births was 3.05. The following comparative table, copied from page 9 of the report, shows the relative position of the colony in relation to the various countries of Europe. The year taken for the comparison is 1894, or the last year of official published returns : —

	Birth Rate.	Marriage Rate.	Death Rate.
South Australia	30.49	6.09	11.64
Victoria	29.17	5.99	13.14
New South Wales	31.48	6.20	12.30
Queensland	31.86	5.70	12.08
West Australia	27.49	6.11	13.99
Tasmania	31.11	5.42	12.42
New Zealand	27.28	6.15	10.19
United Kingdom	29.50	7.30	19.00
England and Wales	30.50	7.70	19.00
Ireland	22.40	4.60	19.40
Scotland	30.70	7.00	18.50
France	22.10	7.60	22.60
German Empire	35.70	7.90	24.10
Prussia	36.30	8.00	23.40
Austria	36.10	7.80	28.80
Italy	36.40	7.50	26.30
Switzerland	28.00	7.30	19.30
Belgium	29.10	7.70	21.70
Netherlands	32.00	7.20	21.00
Norway	29.60	6.30	17.70
Sweden	28.30	5.80	16.80
Hungary	42.30	8.60	33.10

THE INTERNATIONAL STATISTICAL INSTITUTE.

By Roland P. Falkner.

The International Statistical Institute held its fifth session at Berne, August 26 to 31, 1895. The local committee had arranged the details of the session quite skillfully, showing a generous hospitality which was thoroughly appreciated by the guests. The members of the Institute attended the session to the number of about sixty, and the invited guests, professors, and officials of Switzerland were equally numerous.

The labors of the session were divided into meetings of the general assembly, and of four sections, devoted respectively to population, commercial, agricultural, and social statistics. The programme of the general assembly follows: —

Monday, August 26.

Opening Address of the President, Sir Rawson W. Rawson.
Cheyson (Paris). Survey of the Losses Inflicted on the Middle Classes by the Fall of Interest on Bonds, etc.
Schmoller (Berlin). Incomes in the Past and in the Present.
* Kleczniski (Cracow). Statistics of Poland in Former Days.
† Crupenski (Bucharest). Demography of Roumania.

Tuesday, August 27.— Morning Session.

Bodio (Rome). International Mortality Statistics.
Vacher (Paris). The Longevity of Families.
Lexis (Göttingen). Causes of Statistical Regularities.
Troinitsky (St. Petersburg). The Trans-Siberian Railroad.

Afternoon Session.

Rauchberg (Vienna). The Electrical Machine Applied to the Census Analysis.
Bateman (London). The Labor Office.
Moron (Paris). Irregularity of Employment.
* Gruner (Paris). Labor Accidents.
Rasp (Munich). International Savings Banks Statistics Grouped by Occupations.

Evening Session.

Public Lecture on Statistical Laws, by v. Mayr (Strassburg).

* Absent. † Read by title.

WEDNESDAY, AUGUST 28.— Morning Session.

De Foville (Paris). Statistics of the Precious Metals.
Juglar (Paris). Commercial Crises.
Denis (Brussels). International Organization of Labor Statistics.
* Billings (Washington). International Military Medical Statistics.

THURSDAY, AUGUST 29.— Morning Session.

Troinitsky (St. Petersburg). The Utilization of the Means of Communication in Russia.

FRIDAY, AUGUST 30.— Morning Session.

Craigie (London). International Statistics of Agricultural Products.
Inama-Sternegg (Vienna). Morphology of Agricultural Labor.
‡ Körösi (Budapest). A Method of Determining the Influence of Climatological Elements in the Appearance of Disease.
‡ Körösi (Budapest). The Measure of the Density of Dwellings.
Levasseur (Paris). Statistics of Forests.

Afternoon Session.

* Engel (Berlin). Comparative Statement of Workingmen's Budgets in Belgium.
Kiaer (Christiania). On the Method of Representative Enumerations, Serving as a Type of the Entire Population of a State.
† Raseri (Rome). Comparative Statistics of Abandoned Children.
‡ Olanesco (Bucharest). The Anthropometrical Department.

Evening Session.

Public Lecture on the History of Demography, by Levasseur (Paris).

The programme of the general sessions fails to give a complete idea of the labors of the Institute, as considerable time was devoted to the reports of committees and sections. The result was to further crowd a programme which was already too full.

Before taking up the work of committees and sections, we may turn our attention to the papers presented. The crowded programme was very dispiriting to the assembly. Discussion was choked off entirely or greeted with a suppressed impatience which, if it did not chill the orators, gave the assembly the listless appearance of a legislative body during the transaction of routine business. This effect was, perhaps, heightened by the place of meeting, the hall of the national assembly, where the writing materials provided by the local committee tempted the assembled statisticians to epistolary efforts.

* Absent; read in abstract. † Read by title. ‡ Absent.

The Babel of tongues incident to international gatherings was also responsible in part for the slight attention paid to the speakers.

If the first defect of the programme was its quantity, a second was to be found in its quality. The papers presented were of the most diverse order, and at times seemed destined to exhibit the personality of the writer quite as much as to promote the purposes for which the session was held. The papers could be grouped as follows: —

1. Demands for international statistics in various fields.
2. Interpretation of statistical results.
3. Accounts of statistical work in various countries.
4. Discussions of statistical methods.

The papers belonging to the first group were apparently especially appropriate to the discussions of the Institute. This would have been the case had they contained plans and projects for the execution of the statistical researches demanded. But they were in several cases limited to demonstrating that such researches would be valuable. In an ordinary assembly they might have been in place, but in an assembly of specialists it was disappointing to listen for half an hour to the elucidation of some perfectly well-known phenomenon, which reached the weighty conclusion that a committee should be appointed to investigate it.

In an assembly devoted to the promotion of statistical methods the papers of the second class had no place. However interesting and important they might have been elsewhere, the assembly was not concerned with them. Had they applied new methods of analysis or novel groupings of phenomena already known, there might have been some excuse for them. As it was, they did not present any of these characteristics.

Papers of the third class had the merit of brevity. They were confined to an account of the scope of statistical research, and recorded the progress made in this direction.

The fourth category of papers, in which special attention was paid to statistical methods, was not so well filled as it should have been. Accounts of the perfection of statistical method belong preëminently to the scope of the Institute. In every country actively pushing its statistical researches there is a constant advance in method. This is notably the case in our own country, and some of our recent work might properly have engaged the attention of the session.

Considering the papers alone, it is the firm conviction of the present writer that at least one-half of them were inappropriate and should have been omitted. The incoherence of the Budapest Congress of Hygiene and Demography, which was pardonable in an organization having a more popular mission, and practically without restrictions as to membership, was surely out of place in a body like the Institute, supposed, as it is, to represent the small number of the elect of the statisticians of the whole earth. In such a body one looks for clear, systematic thinking, in conformity with the fixed purpose of the gathering. One is disappointed not to find it, though he may be loath to believe that in the multiplicity of congresses the general level of thought must needs be depressed.

If the Institute is to maintain a higher level than more democratic bodies, it is evident to the writer that it needs more direction. He believes that the papers to be presented should first receive the approval of the Bureau. He is sure that the keen sense of the General Secretary, Professor Bodio, would clearly separate the wheat from the chaff. The writer does not presume to maintain that his eminent associates really produce chaff, but that what may be wheat in other quarters may be chaff for the purposes of the Institute. If such a method were pursued a number of papers would be discarded, as they are simply arguments in favor of proposed motions, while others containing information suitable for the Institute would be read by title only.

But if the Bureau cannot undertake the supervision of all papers, let it adopt the procedure which operates so successfully in the *Verein für Social Politik*, and which consists in the selection of one or two topics, and a thorough discussion of them by speakers selected in advance.

In the sections constituted for the study of motions presented, the real work of the Institute was accomplished. Here questions of method were discussed freely and fully, the result of the deliberations being reported to the general assembly. The relative competence of these sections created for the session of Berne, and of permanent committees instituted at previous sessions, was by no means clear. Yet as all committee reports passed through the sections, we may confine our attention to the latter. We may consider briefly the conclusions of the sections which, unless the contrary is stated, were adopted by the general assembly.

At Vienna, in 1891, the Institute had approved the principle, which the Austrian census carried into practice, of exchanging individual census returns of citizens of other nations enumerated in any nation with the census bureaus of the nations to which they respectively belong. While the results in Austria had not proved altogether satisfactory, the Austrian statisticians asked the Institute to confirm the principle, and extend it also to all persons born in any country who might be domiciled elsewhere, irrespective of whether they are or had become citizens in their country of residence. Such a resolution was accepted by the Institute.

The proposition to adopt a standard population with uniform age classes, for promoting comparability in international calculations of mortality, was favorably presented by M. Guillaume. It is proposed that a calculation based on the standard population be added to all reports on mortality. The standard approved by the Institute is based on the population of Sweden, divided into five age classes, as follows: 0–1 year, 2–19, 20–39, 40–59, 60 and over.

M. Nicolaï, of Belgium, pleaded in favor of registers of the population to be established after census operations had taken place, which could be so kept as to record the movement and migration of population. The first section recommended that the subject be studied; and after a debate in the general assembly, which revealed great scepticism as to the practicability of such registers, a committee was appointed to investigate the subject.

Dr. Guillaume, of the Swiss Statistical Bureau, made a strong report in favor of a general census of population in 1900. He demonstrated that, should the date of December 1, 1900, be adopted, the changes to be made by each State would be insignificant. While they might lengthen or abbreviate the customary interval between enumerations, he believed that the confusion thus arising would be fully compensated by the increased comparability of statistics the world over. Whether a date in December would suit the conditions of the United States does not seem to have been discussed, though for us it is by no means a minor matter. Greater difficulty would arise in preparing a uniform schedule and adopting a uniform definition of the words employed. Yet these difficulties will, perhaps, not prove insuperable on closer examination. With unanimity the assembly referred the matter to a committee composed of the statistical officials in each country in charge of the census enumerations.

Dr. von Mayr presented a motion for the publication of an international annual of the movement of population. After a long discussion in the section the contents of six proposed tables were agreed upon. It is supposed that in the first instance such a publication be made by the Institute, but that in the course of time it be given a more enduring basis by the establishment of a special bureau based on an international convention.

In pursuance of instructions given at a previous meeting, the Committee on Infirmities presented, through Dr. Bertillon, a valuable report on the nomenclature of the same. After describing those now in use it proposed three schedules containing, respectively, 29, 56 and 99 classes. By the adoption of any of them, comparison would be possible, though the preference is naturally for the most detailed. Further distinctions should be those of sex and of ages, at least in periods of twenty years. It is proposed that in the case of the existence of two or more infirmities in one person, he should be counted once only, according to the most apparent or most serious infirmity.

Dr. Bertillon also proposed a nomenclature of accidents which had been adopted in Germany, and was already in use in Austria and France.

The statistics of occupations have long engaged the attention of the Institute. In previous sessions a general schedule was recommended. It was felt that its value might be enhanced by the recommendation of a small number (100) of special designations, which might figure in every census, whatever groupings might be adopted. Such a list was prepared and reported to the assembly by Dr. Bertillon.

M. Yvernés, of Paris, called attention to the importance of the subject of divorce, and, after giving an outline of the facts to be specially enumerated, proposed the appointment of a committee to be charged with the preparation of an international report on the statistics of divorce.

If the labors of the first section thus far considered were more fruitful than those of the other sections, it was, perhaps, because population statistics constitute a field where international comparability is most easily attainable. The second section took important action in approving a plan for international statistics of the production, commerce, and consumption of the precious metals. This action was in so far practical that they recognized the necessity of the work

being centralized, and proposed that it should be confided to the government of France. M. de Foville accepted the proposal, which he did not doubt the government of his country would approve.

M. Alfred Neymarck, of Paris, called attention to the losses to individuals incurred by the depreciation of values of personal property and the decline in rates of interest. A committee was appointed to examine the matter, but the vague and indefinite manner in which it was formulated gives little hope that anything will be accomplished.

It was further proposed that agricultural statistics include those of forests, and that particular attention be given to the surface cultivated with the different crops.

The section on social statistics engaged at length in the discussion of three questions,— savings banks, wages, and alcoholism. In regard to the former, Dr. Rasp, of Bavaria, presented an elaborate scheme for a classification of occupations of depositors. As no accord was reached, the matter was passed over to the next session. Concerning wages, the Austrian statisticians, Drs. Inama-Sternegg and Rauchberg, proposed an enlargement of the previous recommendations by demanding exhaustive figures for *all* the wage earners of a given industry or a given district. Many deemed this an impossibility, though the Austrian statisticians announced their intention to undertake such statistics. As it was held that a resolution of the Institute in favor of such statistics might be held as to condemn all previous wage statistics, which are based on partial inquiries, as wholly valueless, modifying clauses were introduced which called for such exhaustive researches, if possible.

Not less important was the action taken in regard to the statistics of alcohol. Director Milliet, of the Swiss Alcohol Bureau, proposed an investigation into the actual state of such statistics in the various countries, and prepared a careful schedule of questions covering the essential points of such statistics. This procedure seems thoroughly practical, and a suitable means of obtaining a notion of the comparability of statistics in this field.

In the course of the proceedings a number of briefer communications were made to the assembly, which found no place on the programme. Among these we can only pause to notice the remarks of Dr. Bertillon on a practical adding machine which Mr. Hollerith had invented, and which he hopes to put on the market at an early date.

With respect to the electrical tabulating machine Mr. Hollerith made the following remarks, which will be of general interest to statisticians : —

"In connection with the interesting report of Dr. Rauchberg on the electric tabulating machine, it may be proper to point out in what direction the mechanical and electrical side of this question will be developed.

"This will be, first, in substituting for the present counters arranged with dials counters arranged with wheels provided with type, so that, after a machine has given a correct result, this result will be printed direct from the counters, thus avoiding the possibility of error in transcribing the result. Besides, it can be done by simply depressing a lever, thus saving considerable time.

"To anyone familiar with mechanical devices, the placing of a card in the electrical machine by hand, then depressing the lever and again removing the card by hand and placing it in the sorting box, must appear exceedingly clumsy. This will be replaced by an automatic feed, which will automatically feed the cards and place them in the proper compartment of what is now the sorting box.

"The machine for punching cards, as now used, is simple but slow. It will be replaced by a machine provided with a key-board. Each key is practically a valve, controlling communication from a supply of compressed air to a given cylinder connected with and operating a punch. With such a machine, as many holes can be punched in one operation as can be controlled through the respective keys, no work other than touching the corresponding keys being required.

"The integrating attachment I have demonstrated with a considerable experiment, embracing, as it did, 5,000,000 cards. The use of this device enables agricultural and similar statistics to be compiled by this method. It makes the machine possible for railroad accounting and similar work.

"These are the lines in which, I believe, the electric tabulating machine will be developed."

It will, I think, be clearly evident that, for the progress of statistics, the labors of the sections were vastly more important than those of the general assembly. The latter simply approved the work of the former, with little or no debate. An immense amount of business was accomplished in the general assembly at the cost of long and fatiguing sessions, and only by omitting discussion as much as possible.

At the close of the session the officers of the preceding year were re-elected. An amendment to the constitution had been adopted during the session, providing for a Third Vice-President. This office was filled by the election of General Francis A. Walker.

REVIEWS AND NOTICES.

EMPLOYMENT OF WOMEN IN ENGLAND.

Report by Miss Collet on the Statistics of Employment of Women and Girls. Labor Department, Board of Trade. London, 1894.

This report contains three parts, treating of: (1) Census Returns of Occupation for 1891; (2) Labor Department Returns of the Employment of Married Women in 1894; (3) Board of Trade Returns of Rates of Wages in the Cotton, Woollen, and Worsted Industries in 1886. There is also an appendix containing tables showing the number and distribution of the female population of England and Wales in 1891, the number of single compared with the number of occupied females by age groups and localities, the number of girls and women employed in the cotton, woollen, and worsted industries, with the proportion of married or widowed women by age groups, and the average weekly earnings of women and girls in these trades.

By far the most interesting and valuable portion of this report is Part I, in which, while treating of the employment of women and girls in general, Miss Collet gives figures bearing directly on the questions of whether the number of women wage earners is increasing rapidly, and whether women are crowding out men in trades which give employment to both sexes. All the data in this section are for female wage earners ten years old and over, and all represent ratios, the absolute numbers unfortunately not being given. In regard to the first question it appears that, while in 1881 the whole number of female wage earners was 340.5 per 1000 of the female population, in 1891 it was 344.2, an increase of only 3.7 per 1000. One cause given for the slightness of the increase is the extension of the factory system, and the consequent substitution of a class of skilled workers employed steadily for a much larger class of unskilled workers, employed intermittently in garment making and casual occupations. Thus, in 1881, of every 10,000 female wage earners, 82 were classed as shirt makers and seamstresses; in 1891, 46 per 10,000; in 1881 the number employed in washing and bathing service was 177 per 10,000; in 1891, 162. In these cases the establishment of shirt factories and steam laundries has replaced the large body of untrained workers

who took up such occupations from time to time, as they could get employment, by a smaller number of workers engaged with comparative steadiness. A more interesting example of the same process is found under the heading "Sick Nurses, Invalid Attendants, etc.," where, while the whole number of women so employed had increased during the decade by 9 per 10,000, the number of those over 65 years had decreased by 31 per 10,000, which would seem to indicate that younger women who have received special training as nurses are taking the places of the older women, who used to take refuge in nursing. In this case, it is true, there has been an increase in the total number employed; but it shows plainly, nevertheless, the tendency to displace large numbers of untrained and intermittent workers by a class of trained workers seeking constant employment.

Concerning the question of whether women are crowding out men, detailed statistics for the decade 1881–91 are given for eighteen principal trades in which women are employed. In seventeen of these men are also employed. In three trades — Cotton goods manufacture, Shirt making, and Washing and Bathing service,— there has been a large decrease in the number of women and a small increase in the number of men. Four classes show an increase of women and a decrease of men; five show an increase of both men and women; four show a decrease of both; and one shows a decrease in the number of women, while the number of men remains stationary.

It must be remembered that these statements show only ratios of increase and decrease, and that there "is not a single case of absolute decrease of numbers of males in any group which does not also show an absolute decrease in the number of females employed." It is noticeable that in the textile trades men have more than held their own. In cotton-goods manufacture the relative number of women employed has decreased by 13 per 10,000, and of men has increased by 2 per 10,000; in worsted-stuffs manufacture the relative number of women has decreased by 3 per 10,000, and of men has remained stationary, while in woollen-cloth manufactures the number of women has decreased 5 per 10,000, and of men 4 per 10,000. In the trades employing but a small number of women the proportionate increase of men has been far greater than that of women. Thus the increase in the number of male wage earners employed as commercial clerks was, during this decade, 282 per 100,000, and of female wage earners only 96; in the printing trades the increase was for males 140 per

100,000 and for females 17. In general, these tables seem to show clearly that there is no danger of women crowding out men, and that in many trades they are not holding their ground in comparison with men.

The tables giving the number of women engaged at different age periods, in the principal trades employing women, show a marked decrease (22 per 10,000) among those engaged in domestic service. This decrease occurs entirely among those under 25 years of age,— a fact which, coupled with the increase in the number of those under this age in what may be called factory trades, suggests a tendency on the part of young girls to go into factories rather than into service. This is further indicated by the fact that, while the increase in the number of girls employed under 15 was very marked, this increase took place mainly in urban districts, where the chance for a young girl to obtain some occupation other than domestic service would naturally be greater than in the country. It is noticeable that while the number of females under 25, and more especially of females under 15, employed in factory trades, has largely increased, the number above 25 so employed has diminished. This is probably due to the use of improved machinery and the greater sub-division in these trades, which make it possible for children and young persons to do much of the work formerly done by grown persons. Only two of the occupations considered in these tables require professional training, and in both of these, teaching and nursing, women show an increase, falling, as might have been expected, within the age period of 25 to 45 years.

The statistics concerning the employment of married women are unsatisfactory, owing to the rough method used to obtain the figures. The process has been to subtract from the whole number of women returned as occupied in any given district the number of women returned as single for the same district, the remainder representing the minimum number possible of women both married and occupied. From a comparison of these minimums Miss Collet thinks it safe to conclude that the employment of married women as wage earners is declining.

The remainder of the report is devoted to the Labor Department statistics of employment of married women in the textile industries in 1894, and the Board of Trade statistics of rates of wages in the same trades in 1886, and is not of such general interest.

M. K. Conynton.

TAXATION IN PARIS.

The Tax Paid by a Parisian Family. Report by L. Beaurin-Gressier, *Journal de la Société de Statistique de Paris*, October, 1895.

This report embodies the results of the personal, painstaking work of M. L. Beaurin-Gressier, of Paris, in an original investigation during the year 1894, of the exact proportion of the expenses of his family, which went as a tax to the treasury of the State. The statistical work involved was shown in tables published in the July *Journal de la Société de Statistique de Paris*. In the report M. Beaurin-Gressier states that he does not attempt to make the result of his work a criterion. The tax paid by families varies with conditions, and only when supplemented by similar reports from other families would the results he obtains permit of generalization. During the year 1894 every item of expense was tabulated by him in detail. These expenses he grouped as follows: —

First. Those in which the final incidence of the tax involved is relatively easy to determine. (1) Residence, (2) Food, (3) Heat and Light, (4) Clothing, (5) Articles for the kitchen and household, (6) Personal property, (7) Perfumery, (8) Conveyance, (9) Recreation, (10) Presents, (11) Sundry.

Second. Those paid for services or salaries in which the tax involved is transferred to those receiving the amounts. (1) Dwelling, (2) Clothing, (3) Care of body, (4) Intellectual culture, (5) Wages, (6) Gifts.

Having done this, the more delicate task was to determine the exact percentage of tax paid in each expenditure in order to calculate the total tax paid. He defines tax as that remuneration paid by every individual to the State for the expenses of the social organization. This cuts off remuneration for services actually rendered by the State, such as for posts and telegraphs. The determination of the percentage of tax is often rendered more difficult by the varying, complex incidence of most taxes. To facilitate this determination, M. Beaurin-Gressier compiled from different official sources a series of statistical tables, which were published in the July *Journal*. The general headings of the first of these, "Table A," are as follows: —

1. Taxes paid directly by the contributor.
2. Taxes involved in services rendered.
    a. Taxes involved in services rendered by monopolies.
    b. Taxes involved in services rendered by "concessions."

3. Taxes in which the seller is more or less the direct collector.
   a. Taxes on consumption (octroi, customs, etc.).
   b. Taxes on production.

This table constitutes the essential basis of the report. Taxes intentionally ignored are (1) taxes on capital, (2) taxes on the revenue of personal property. The first he regards as manifestly outside his work. The second he considers has an incidence shifted to the public. In the table is figured out the tax paid the State, Communes and Departments, and the Customs on every item placed under the sub-headings of the taxes to be paid. Given the itemized expenses of his family, and the percentage of tax in every 100 f. paid, this could be easily done. His method of determining the rate is more interesting. The last set of tables in the July *Journal* show this, and one will suffice as an example. The first of these, "Table C," relates to the service of posts and telegraphs, the figures being obtained from *Le Bulletin de statistique du Ministre des finances*, 1893 (p. 512). It is as follows: —

Total receipts of the service, ...		201,859,676 f.
Total expenses, ...	148,851,214 f.	
Grants to boat service, ...	22,929,262	125,921,952
		75,937,724 f.

$$\frac{x}{100} = \frac{75{,}937{,}724}{201{,}859{,}676} \qquad x = \frac{7{,}593{,}722{,}400}{201{,}859{,}676} = 37 \text{ f. } 62.$$

For every 100 f. paid then for posts and telegraphs in the family expenses for the year, 37 f. 62 are put down for the tax paid to the treasury of the State. Other rates were similarly determined. The tax paid for consumption,— by far the heaviest in Table A,— the rate is of course largely determined by the octroi and customs rate. Most complicated is the rate on production taxes, and these are not given place in the table, as they touch the family expenses in the prices paid for materials, and hence fall into place under other headings. The expenses of the family for those things of which the final incidence is easily determined were, for the year, 14,117 f. 75, with the rate tax of 23 f. 02.

In conclusion M. Beaurin-Gressier points out that a mere determination of the percentage of taxes paid by his family was not his only object. The principles they show are more important. His conclusion is that the present French fiscal system levies taxes on the manifestations of wealth, and not on the revenue. Pretending to

strike resources, taxes in reality strike expenses to which they are proportional instead of to the revenue. The tax, in fact, is often specific instead of general, and takes most from articles which may increase in value without a similar increase in tax. He therefore condemns the system, and, above all, the present tax on consumption. Reform, he says, should first busy itself with modifications of the modes of application of existing taxes. Consumption taxes should be made true taxes, *i. e.*, their end should be to furnish resources to the State, and not to furnish particular advantages or privileges favoring certain branches of industry. Many millions of francs, ostensibly paid as taxes, in truth go for such charges. It is enough to support the legitimate charges of the nation. At present the invisible hand of supplemental charges takes a portion from every table. With these unjust charges removed population would increase, the revenue of other taxes would increase astonishingly, and there would be a new financial, physical, and moral nation.

WM. HERBERT KING.

TAXATION IN ILLINOIS.

Eighth Biennial Report of the Bureau of Labor Statistics of Illinois. Subject: *Taxation.* By the Commission, George A. Schilling, Secretary. Springfield, Ill. 1895. Pp. 490.

This is a most exhaustive study of the appraisement of property for taxation in the State of Illinois, and especially in the city of Chicago. Incidentally, and with a view to explanation, the book contains some philosophical disquisitions on taxation, which add a good deal to the interest of the compilation, and which may be found of value. Especially ingenious is the explanation submitted by the Bureau to justify taking up a line of investigation which appears rather foreign to labor issues. The distribution of taxes is offered as a partial solution of the unsatisfactory labor conditions. It is argued that the workingmen are, by the shifting of taxes, compelled to pay most of them indirectly, and are, besides, taxed out of proportion on whatever of their property is visible and tangible. But we have good reason to be grateful that, by whatever reasoning, this Bureau has been able to work in a compilation of taxation statistics with an abundance of detail; for this is an undertaking to which many influ-

ential citizens object, and which, in consequence, few governmental statisticians desire to take upon themselves.

The very first table contains a surprise for everybody who is not familiar with the practice of tax-dodgers. It shows that the county of Cook, including the great city of Chicago, listed in 1894 but $43,925 as moneys of bankers, brokers, etc., an average of but $.037 for each inhabitant, while Peoria county, with one-seventeenth the population, reported $279,684, an average of $3.974, and some of the poorer counties showed a much higher average. The actual amount on hand in these banks on June 5, 1893, in Chicago, was $18,991,771 according to their own statements published to reassure their depositors in time of panic.

A similar under-valuation is discovered in the assessment of moneys in other hands than brokers, etc., which in Cook county is given in at $434,244, or $.364 for each inhabitant. Scott county, with but 10,304 inhabitants, reports $271,500, or $26.349 for each inhabitant.

The value of the shares of State and national banks at Chicago was assessed at $357,353, while Sangamon county, with a population of but 61,195, gave in $438,013. These shares, according to law, are to be assessed at their "fair cash value," which for Chicago would have been more than $36,000,000. The capital stock and surplus of each of these banks are tabulated and compared with the assessors' returns. The capital and surplus amounted to $59,732,600 and the assessed value to but $6,246,050.

Residents of Cook county returned just $1280 of shares in companies not of Illinois, which would indicate either that Chicago people are indeed poor, or that they distrust foreign securities in an excess of patriotism. Residents of Cook county also possess $6,275 invested in real estate securities on bond and trust deed. And in the matter of specific articles,— such as safes, steam engines and boilers, watches and clocks, pianos, sewing machines, and the like,— the under-valuation is quite as great. For instance, in the great county of Cook but $13,483 is reported as invested in saloons and eating houses, and but $3,385 in billiard and pool tables. The whole State makes a bad showing in this matter, but Cook county easily leads all the others.

The analysis of the assessments of real estate is especially complete and satisfactory. It is found that, while the cost of new buildings

erected in Chicago from 1876 to 1893 is estimated to be $418,718,602, the assessment of all the buildings was in 1893 but $123,745,832.

The permits for new buildings for the years 1890, 1891, and 1892 indicate that buildings costing $129,364,250 were erected in these three years alone. The valuation of the real estate of the city of Chicago in 1870 for city taxation was $223,643,600, and for 1874, $258,549,310. Thus it appears that the value of real property has declined, while the population has quadrupled. The real property in the rest of the State is also undervalued, but in nothing like the same ratio.

But even more instructive than these comparisons are the tables of individual properties with appraisements of fees and buildings separately, and with estimates of their values, drawn from official sources, from records of transfers and the like. These tables are enriched with percentage tables, showing at just what percentage of the total value ground and buildings are respectively appraised. There are great contrasts and discrepancies in the valuations, but it is abundantly proven that down-town business property of the city of Chicago is appraised at but about 10 per cent of its fair value on the average, and that the valuation of buildings is about twice as large a percentage of the true worth as the valuation of the ground. Singular and apparently inexplicable reductions of the already too low appraisements are noted.

Next follow tables of valuations of choice dwelling property, which show similar and even greater under-valuation. The average appraisement of thirty pieces in the most aristocratic localities is but 7.78 per cent of the value. The studied under-valuation of sites is here abundantly illustrated, also, by separating the two items in the cases of several north-side residence holdings. In contrast with this is the valuation of eighty dwellings which were sold in 1893 for $4000 or less. These were appraised as high as even 40 per cent of the prices obtained at actual sale, and the average valuation was 15.9 per cent of the selling price, which is more than twice as high as the appraisement of the residences in the more aristocratic portions of the city.

The gist of the matter is, first, that land is taxed at a lower relative valuation than buildings, and small holdings at a higher relative valuation than large holdings. This is further illustrated by a table of

vacant properties on the west side which were valued at but 5.7 per cent of their worth. On the contrary, twenty buildings in the same part of the city are found to have been assessed at 15.95 per cent of the cost. It is further demonstrated that the value of the site, which is appraised at the lowest percentage, is a greater percentage of the total value of improved property among cheap residences than in business localities or in choice residence quarters.

A long and exhaustive list of the owners of down-town property in Chicago, with much statistical information about their holdings, is included. It required no little courage to face the storm of resentment which this publication must have occasioned; but it is likely to be of great and permanent value. Incidentally, in connection with these tables, it is shown that vacant down-town property is appraised ridiculously low by the assessors.

These tables are followed by others showing the movement of appraisements of both realty and personalty in every county in the State, from 1873 to 1893. Then come comparisons of the mileage and the appraisements of railways. This includes valuations of lands, lots, personal property, tracks, right of way, improvements, and rolling stock. The increase of the assessment from 1873 to 1893 is but from $59,317,407 to $79,531,738, and the average per mile of road fell from $6384 to $4343. The total appraisement was but one-half that of the railroads in Indiana, and the assessment per mile but a little over one-fifth.

Tables are also given showing the valuation of the capital stock of various manufacturing and financial corporations in the State other than railroads and banks. The appraisement varies from 1.3 per cent of the par value to 143 per cent. As usual, the richest and most powerful obtain the most favorable appraisements. For instance, Pullman's Palace Car Company got off at 4.92 of the par value, the stock actually being worth 170 or more. The total appraisement of corporations with capital stock of $167,045,035 was $15,735,390, which covered also all tangible personal property. The percentage of par value of stock was 9.42 per cent, and this percentage is deceiving; in 1890 it was 15.83 per cent. A similar decrease in appraisements is discovered in the cases of the great street railway and lighting corporations of Chicago.

A considerable portion of the report is devoted to a study of the remedies for the inequities of this absurd condition of affairs. A list

of long-term leases of school property is appended. A complete list of properties sold in 1890, 1891, 1892, 1893, and 1894, on which the Commissioners based some of their estimates of value, is also appended, together with a report of certain events in the field of labor, and papers and addresses on labor and cognate subjects.

MILES MENANDER DAWSON.

CANADA ASSURANCE.

Canada Life Assurance Company. Mortality Experience, 1847 to 1893. Published by the Company, Hamilton, Ontario.

This compilation covers an experience of forty-six years, comprising 296,481 lives exposed, being the select male lives only. The compilation is made by A. G. Ramsay, F. S. S., F. I. A., the President and Actuary of the Company, and by Frank Sanderson, the Assistant Actuary. The total number of entrants was 35,287, of which number 55.03 per cent were in existence at the close of their respective policy years in 1893; 37.07 per cent had retired from the company by withdrawal, maturity, or expiry, and 7.9 per cent had died. The average age at entry was 31.74 years; the average duration of the insurance, 8.4 years; and the average duration of the policies terminated by death, 13.55 years. The percentage of persistents is very large for so long an experience, covering also the high-pressure period of recent years; the average duration is unusually high. About one-half of the total withdrawals were experienced during the first year of insurance or at its close.

The compilation is made on the basis of policy years instead of calendar years, thus giving greater accuracy, though at much greater labor. A mortality table is constructed from the data thus obtained, coinciding with the company's experience, and a second table coinciding with its experience on lives insured a longer period than five years. To complete the tables, a third one is constructed to show the mortality for each of the first five years of insurance.

Comparisons are made with the experiences of other companies, covering duration of risks, expectation of lives, actual to expected deaths, etc. The experience of the Canada Life is found to be in all respects more favorable than any others, excepting only the Provi-

dent Life and Trust Company, of Philadelphia, which covers comparatively few lives and a short period of time in the early history of the Company, and the Australian Mutual Provident Society, of Sydney, N. S. W., on selected lives.

The actuaries remark of this experience: "A comparison of this table will show that neither the American experience table nor the Institute of Actuaries (H^m) experience is a very faithful exponent of the mortality as experienced by the Canada Life." This agrees also with what Richard Teece, Manager and Actuary of the Australian Mutual Provident Society, yet more forcibly remarked concerning the same tables, namely, that no well-conducted company is likely to experience the mortality which they indicate. This is a fact which is of the greatest importance when it is remembered that our laws arbitrarily judge the solvency and indirectly limit the minimum premiums by a yet more completely obsolete standard, the 17 Offices or Actuaries' table.

Two things are rather amusing about this compilation. One is the evident disappointment that the experience of the Australian Mutual Provident Society appears to be more favorable by never so small a margin. Several clever but futile attempts are made to explain this away. Another is the following effort to justify the company's refusal to return the unexpended portion of a policy holder's premiums on his retirement: —

"This table confirms the investigations of Messrs. Sprague, King, and others, viz., that shortly after entry the lives, on the average, seriously deteriorate, but afterwards show a marked improvement. Thus, examining the rates in the above-named table, it will be seen that while there is a sudden rise in the rates for the second five years, an improvement is usually shown either in the third or fourth quinquennium. The most natural explanation of this is that the large number of healthy lives withdrawing in the earlier years brings about a deterioration in the body of remaining lives, thus causing the higher resulting rate in the second five years; but after the effect of this has worn off an improvement takes place. It follows from this that if a company were to guarantee from the outset the full reserve each year as a surrender value, thus offering a temptation to healthy lives to withdraw, a serious injustice might result to persistent members."

It is really astonishing that such sophistry as this can be put forward, with the experience of the Scottish Widows' Fund, the Australian Mutual Provident Society, and other cash surrender companies,

so completely refuting, first, the deduction that such surrender values increase withdrawals, and, second, that such companies experience an unfavorable death experience.

The Canada Life has not done much "rating up" or insuring of diseased lives. Altogether, but 754 have been rated up, and their average duration has been but 3¼ years. Of these, 89 have died. The actual deaths at actual ages, compared with the company's experience on select lives, is 89 to 76; compared to H^m experience, 89 to 106; at assumed ages the expected losses by the company's experience were 86, and by H^m 120, so that the rating up may be considered to have been successful.

MILES MENANDER DAWSON.

VITAL STATISTICS.

Mouvement de la Population de la Suisse pendant l'Annee 1893. Berne, 1895.

This document constitutes No. 101 of the valuable series of publications issued by the Federal Bureau of Statistics of Switzerland. It contains the following tables: —

1. General Table of vital statistics by Cantons and Districts.
2. Deaths (exclusive of still-born), by ages.
3. Deaths, by causes.
   (*a*) By groups of causes.
   (*b*) By certain specified causes.
4. Vital Statistics of fifteen principal cities.
5. Notifications of infectious diseases in 1893, by months and by places.
6. Divorces in 1893.
7. Deaths and causes of death not certified by a physician.

The population of Switzerland in 1893 (estimated) was 2,974,473, and the marriages, births, and deaths, with the rates, were as follows: —

		Rates per 1000 Inhabitants.
Marriages, . . .	21,884	7.3 (14.6 persons married).
Births, ...	88,100	29.6
Deaths, ...	61,059	20.5

Under the head of deaths, the age groups selected for presentation are deaths under 1 month, 1 to 11 months, 1 year, 2–4 years, 5–14, 15–19, 20–29, etc.

The table of vital statistics of cities shows that the city of Freibourg had the highest death rate (25.5 per 1000) and Herisan the lowest (15.3) in 1893. That of Zurich was 19.6, Geneva 21.1, and Berne 21.3. The table of infectious disease notifications is unsatisfactory, in consequence of the indefinite manner in which some of the cantons, notably Berne and Vaud, report epidemics,— the term "many cases," etc., being frequently employed instead of definite figures.

The divorces in 1893 were 903, a notable and quite steady decline since 1876, when there were 1102. The standard of comparison here differs from those employed by other authorities. The ratio presented is that of divorces to *existing married couples*, and was 1.86 per 1000 existing marriages in 1893 as compared with 2.48 in 1876. (That of Massachusetts in the State census year 1885 was 1.75 per 1000 existing married couples.)

The number of deaths not medically certified in Switzerland in 1893 was 4432. Of this number, about one-third were those of infants of less than one year old. The certificate of a midwife is accepted as a medical certificate of death only in the case of infants dying within the first months of life.

Breslauer Statistik. Im Auftrage des Magistrats der königl. Haupt- und Residenzstadt Breslau. Herausgegeben vom statistischen Amt der Stadt Breslau. Bd. 16, Erstes Heft. Breslau, 1895.

This first part of the sixteenth volume of the publications of the statistical office of Breslau contains a summary of the population and vital statistics of that city for 1893. A portion of the volume is devoted to the statistics of the sick, presented by the hospitals, infirmaries, asylums, societies for insurance and relief, etc.

Other tables are presented, giving meteorological statistics, the prices of the staple articles of food at wholesale and at retail, and, as is common in some of the large German cities having very careful police supervision, statistics of migration of householders.

The estimated population of the city at the close of 1893 was 356,522, that of 1892 having been 349,248. The births were 12,705,

of which 96.8 per cent were living and 3.2 per cent were still-born; 84 per cent were legitimate and 16 per cent illegitimate. The birth rate was 36.1 per 1000; the deaths were 10,285, or 29.2 per 1000. The death rates by ages were as follows per 1000 of persons living at each age period: —

0-5 years,	128
5-20 "	5
20-40 "	10
40-60 "	26
Over 60 years,	83

Tables are presented giving the deaths by principal causes, and also very full tables for all causes, with numbers for sexes, ages, seasons, and districts of the city. The deaths by groups were as follows: —

Infectious diseases,	21.1
Other general diseases including tuberculosis diseases,	20.4
Diseases of the nervous system,	14.3
" " " respiratory system,	16.1
" " " digestive organs,	2.3
Other local diseases,	9.4
Diseases of infancy and old age,	11.8
Deaths by violence,	2.7
Deaths from unknown causes,	1.6

The chief point of interest in that portion of the volume which relates to statistics of the sick is that which treats of the notification of infectious diseases. Laws requiring notices of this character to be made to the sanitary authorities are being introduced into the legislation of nearly all civilized countries. From the statistics required by such laws valuable information is gained as to the fatality of certain infectious diseases in different countries. The following are the percentages of fatality from diphtheria, scarlet fever, typhoid fever, and measles in Breslau, England and Wales, and Massachusetts, for 1893: —

PERCENTAGE OF FATALITY.

	Diphtheria.	Scarlet Fever.	Typhoid Fever.	Measles.
Breslau	34.9	4.9	22.2	2.6
England and Wales	24.5	4.2	17.0	....
Massachusetts	31.7	8.8	20.0	1.6

Another section of this document presents the prices of the staple articles of food in Breslau at wholesale and retail, during the year 1893, by tables and diagrams, by which it appears that prices gener-

ally declined for nearly all articles during the year. For example, the prices of the principal cereals per 1000 kilos (about 220 pounds) were as follows for January and December, 1893: —

	January.	December.		January.	December.
	Marks.	*Marks.*		*Marks.*	*Marks.*
Rye, wholesale..	12.75	11.70	Beef, wholesale..	92	90
Rye meal, " ...	19.75	17.75	Veal, " ..	92	88
Rye bread, retail.	20.68	19.12	Mutton, " ..	82	76
Wheat, wholesale	14.48	13.22	Pork, " ..	98	92
Wheat flour, "	24.38	21.12	Beef, retail.....	141	138
" " retail	28.50	27.50	Veal, "	138	134
" bread, "	37.26	34.36	Mutton, retail...	140	138
			Pork, " ...	147	141

Other tables are given, presenting the maximum and minimum prices, and the difference, as compared with the prices of 1892, for all the ordinary articles of food and other articles of household use offered for sale in the city in 1893.

S. W. A.

CHARITY STATISTICS.

Armenstatik. Compiled by H. Silbergleit, Superintendent of the Bureau of Statistics for the City of Magdeburg. Magdeburg, 1895. Pp. 29.

This report deals wholly with those who received aid of some kind from the city during the year 1893–94. These are divided into two main classes: those receiving aid directly from the city, and those (mostly wives and children of the first class) who were indirectly aided. The statistics here given deal mainly with those of the first division, who are classified with great minuteness of detail.

The recipients of direct aid are first divided according to sex and age periods of 15 years; this primary classification is maintained throughout the remaining tables. The absolute number and the proportion of the total population receiving aid is given for each city district; the kind of aid received, whether in-door, out-door, or both, and its duration; the proportion of the whole population receiving aid, its kind and duration; the number dependent on each recipient

of direct aid; the birthplaces of those aided, classified according to kind and duration of aid; a classification of the recipients of each kind of aid according to their present dwelling place; the causes assigned for their poverty; their conjugal condition, whether single, married, widowed, divorced, or deserted; their occupations; their religion; and finally, a classification of those born elsewhere according to the year of their arrival in Magdeburg.

The table devoted to causes of poverty shows that 38.7 per cent of the cases were due to physical disability occasioned by illness, accident, etc., and only 8.2 per cent to disability arising from old age; 49.6 per cent of the men assigned the first cause for their poverty; 2.9 per cent the second. Among the women, 28.8 per cent gave the first cause and 12.9 the second. Low wages is given as a cause by 21.6 per cent of the men and by 34.5 per cent of the women. On the other hand, lack of work is given by 18.4 per cent of the men and by only 2.3 per cent of the women.

Classified according to their occupations, the recipients of aid show, as might be expected, a large preponderance of artisans and unskilled workers. Among the men, 33 per cent (954 in a total of 2888) are classed as artisans and 56.3 per cent (1626) as unskilled workers; among the women, 6.7 per cent (215 in a total of 3220) were artisans and 40.7 per cent (1313) unskilled workers. It is noticeable that only 1.8 per cent (59) came from the ranks of domestic servants.

Finally, a classification of those born elsewhere, according to the time of their arrival in Magdeburg, shows a sudden increase in the influx since the close of 1892,— an increase shown only among the men. Of the 2146 alien-born men now receiving aid, 89 (4.1 per cent) came in 1890, 57 (2.7 per cent) in 1891, 66 (3.07 per cent) in 1892, 385 (17.9 per cent) in 1893, while in the first quarter of 1894 177 had already arrived. The figures for women show much the same results until 1893, which year saw the arrival of only 111 (9.7 per cent) of the 2168 alien-born women now receiving aid, while in the first quarter of 1894 only 16 had arrived. In other words, while the number of women born elsewhere is a little greater than the number of men (2168 to 2146), there has been since the close of 1892 a sudden increase among the men, which is not found among the women.

M. K. Conynton.

Thirteenth Biennial Report of Public Charities of Illinois. Springfield, 1894. Pp. 127.

Statistics are given which illustrate the workings of the new Illinois lunacy law; 2161 persons were declared insane from July 1, 1893, to December 25, 1894. Of these, 1832 were committed by juries and 329 by boards of medical commissioners. Pages 71–76 deal with legislation for the prevention of blindness, and furnish some interesting statistics. There is also on page 38 some slight statistical data with regard to epileptics. It is estimated that in Illinois there are 8000 epileptics, of whom 10 per cent are in the care of the public.

CRIMINAL STATISTICS.

Annual Report of the Department of Police and Excise, Brooklyn, N. Y., for 1894. Pp. 137.

This volume has more than ordinarily complete statistics on arrests, character of those arrested, and the conditions of arrest. Statistics are given by days in the week and by the hours of the day. The following is the table of arrests by days: —

Sundays,	7177	Thursdays,	5338
Mondays,	6230	Fridays,	5594
Tuesdays,	6499	Saturdays,	6586
Wednesdays,	5851		

From the table on page 32, of arrests for offences, the following condensation is made: —

	Offences against Person.	Offences against Property.	Felonies.	Disorderly Conduct	Drunkenness.	Drunkenness and Disorderly Conduct.	All Other Charges.	Total.
1875	17,074	7,626	2,887	1,487	9,192	1,061	10,003	24,700
1880	22,623	4,152	2,858	1,376	10,207	1,058	11,286	26,785
1885	22,759	4,132	2,776	282	12,898	.....	11,485	27,391
1890	33,021	5,285	3,376	338	22,547	.....	12,053	38,314
1894	36,136	7,139	4,497	796	25,073	.....	12,909	43,275

A large part of the increase in the statistics of crime is thus seen to be accounted for by the drunkenness column.

On page 38 is a column showing the voters registered from 1872 to the present time. The enormous fluctuations throw an interesting light upon the interest which is taken in the suffrage at different periods. The number of buildings erected in 1894 was one-third less than in 1893. There has been a fairly constant decrease in the number of buildings erected since 1889. On page 45 is an interesting table showing the permits issued for processions and parades during the year, with the number of persons taking part and the object for parading; 1066 permits were granted, of which 106 were for funerals, 142 for picnics, 77 for target excursions, 104 for festivals, and 637 miscellaneous. The census of the unemployed taken by the police in 1894 is given.

RAILWAYS IN UNITED STATES.

Seventh Annual Report of the Statistics of Railways of the United States for the Year Ending June 30, 1894. Prepared by the Statistician to the Interstate Commerce Commission. Washington, 1895. Pp. 102; diagrams 9.

The tables in this report are based upon 98.31 per cent of the total railway mileage of the country. For the first time a decrease in the number of railway employes is reported by this office. On June 30, 1894, there were in the employ of railways 779,608 persons, as against 873,602 persons in 1893. This shows a decrease of 93,994. "If four persons to the wage earner be accepted, it shows that the number of persons deprived of their regular income on account of the depression of the transportation business in the year ending June 30, 1894, was 375,976."

A new feature in this report is the summary which shows the average daily compensation of railway employes by classes for the years ending June 30, 1892, 1893, 1894.

The stock on which no dividends were paid during the year amounted to 63.43 per cent of the total amount of stock outstanding. The funded debt upon which no interest was paid was 17.29 per cent of the aggregated funded debt. From a statistical point of view it

is interesting to note that the report abandons the terms "average cost of carrying one person one mile," and the "average cost of carrying one ton per mile." "These have been abandoned on account of the uncertainty of the rule which it was necessary to adopt for their compilation."

The number of railway employes killed during the year was 1823, and the number injured 23,422; this is a substantial decrease; 324 passengers were killed and 3034 injured; 4300 "other persons" were killed and 5433 injured.

FAMILY CONSUMPTION OF WHEAT-FLOUR.

The following letter has been issued by the Division of Statistics of the United States Department of Agriculture, under date of Oct. 28, 1895: —

Dear Sir:—For the purpose of ascertaining how much wheat-flour is consumed in families of different races and occupations, this circular is sent to correspondents in all parts of the country, with the request that each person receiving it will write a statement of facts with regard to one family (his own or another) on the other side of the slip, and return it to this office in the accompanying penalty envelope, which requires no postage.

Please state the quantity of wheat-flour, in pounds, actually consumed by the entire family during the last recent year for which the fact is exactly or approximately known. The time need not be a calendar year, but should cover precisely twelve months. If the quantity is not precisely known a close estimate of it will be acceptable. In making this estimate it may be helpful to remember that flour is usually purchased at comparatively regular intervals and in comparatively fixed quantities. Perhaps there are memorandum or account books, kept by the family or its flour dealer, which may assist you, or you can tell from the amount of wheat taken to the miller for the family's supply of flour.

Include wheat-flour only. In reducing measures to pounds, allow 196 pounds to a barrel of flour and 43½ pounds of flour to a bushel of wheat.

Among members of the family, include boarders and hired hands if fed from the same stock of flour. If anyone has not been in the family for the full year covered by the return, report him as a fraction. For illustration, a hand that has been boarded but eight months, or two-thirds of a year, should be reported as two-thirds of an adult, and a child that has been away six months at boarding school as half of a child.

Under the head of "Remarks" please say whether the amount of flour was determined by mill or store or household accounts, or simply estimated. Also give any reasons you may have for believing that the individuals of this family are or are not fair representatives of the average of their race and occupation in their county, and any circumstances that may tend to make their flour consumption either greater or less this year than in previous years.

Very respectfully, HENRY A. ROBINSON, *Statistician.*

The inquiry calls for the "Race," and the number in family, of different ages, of those filling out the blanks.

NOTES.

Catechism for Social Observation; a Manual of Social Phenomena. By C. R. Henderson. Boston: D. C. Heath. 1894. Pp. 58.

This little pamphlet will furnish elementary suggestions to those who are interested in observing and arranging in an orderly way notes on the social phenomena which they observe around them. It is elementary in its character, and yet placed in the hands of teachers and serious-minded students ought to result in the collection of a large amount of data which now escapes definite description.

Katalog der Bibliothek des Statistischen Amtes der Stadt Dresden. Second Edition. October 15, 1894. Dresden. Pp. 119.

The number of titles in the first catalogue was 550 with 1200 volumes; the second edition numbers 2500 works with 7500 volumes. The catalogue follows a geographical grouping. It will be of special service to libraries and those interested in keeping a record of the statistical publications of foreign countries.

Eleventh Census of the United States, 1890. Report on Insurance Business in the United States. Part 1. Fire, Marine, and Inland Insurance. Charles A. Jenney, Special Agent. Washington, 1894. Pp. 1127. The text of this Report is very short, being only four pages in length, the rest of the volume being made up of tables.

During the decade 1890–89 the property of the people of the United States was protected by insurance to the amount of $120,067,235,826. For this protection the people paid $1,156,450,512, or an average

rate of $0.9632 for each $100 insured. The amount returned to the insured in payment of losses was $647,663,097, or an average of $0.56 for every dollar of premium paid.

Memoir of Henry Wheatland, M.D. By William P. Upham. Reprinted from the proceedings of the Massachusetts Historical Society. 1895. Pp. 27.

Dr. Wheatland, at the time of his decease, was one of the oldest members of the American Statistical Association, his interest in this Society dating from January 13, 1847.

The Rain and Snowfall of the Province of Ontario. By Hugh V. Payne. Meteorological Service. Dominion of Canada. Ontario. Pp. 16 and chart.

The service is now able to make use of observations for 50 years at Toronto, and from the record it would appear that, as regards rainfall, the annual amount is decreasing, and the number of days of rain increasing. As regards snowfall, it does not appear to be any different, but the mean total precipitation seems to point to a decrease. A table is given showing all the rainfalls that have occurred in Toronto in 24 hours during the last 50 years of two inches and over. There have been 29 such occasions. On 10 different days during the past 40 years there has been a snowfall exceeding one foot in 24 hours.

Seventh Report of the Custody and Condition of the Public Records of Parishes, Towns, and Counties. By Robert T. Swan, Commissioner. Public Document. Boston, 1895. Pp. 39.

With regard to the subject of records of births, marriages, and deaths the Commissioner reports that a bill has been drawn covering the whole matter of returning and recording, which is now being considered and criticised by various associations. The bill as finally approved will probably be laid before the Legislature.

Garland's Banks, Bankers, and Banking: A Financial Directory of Canada. Second edition. Ottawa, 1895. Pp. 515.

With the present interest that exists in the future of the banking system of the United States, this volume is of special value and interest. There is considerable historical material in regard to

banking and currency in Canada, and various statutes relating to the subject of banking and money are included. Among them are the Banking Act of Canada, the Savings Bank Act, Bills of Exchange Act, the Winding-up Act, the Insurance Act, and also summaries of the commission laws of the different provinces of Canada. There is a synopsis of the banking systems in other countries, and summaries of the currency systems of the principal states of the world. In the appendix are abstracts of the annual statements of the principal banks of Canada, which include the verbatim reports of the proceedings of the annual meetings of the banks.

As further contributions to the literature of taxation may be noted the report of the special Committee on Taxation, of the Cleveland Chamber of Commerce, April 6, 1895, pp. 22; and *Taxation in Ohio*, an address delivered by Hon. M. E. Ingalls in Cleveland, June 6, 1895. The report furnishes fresh statistical evidence with regard to the escape of personal property from listing. The committee recommend (1) the repeal of the constitutional provision which requires all property to be taxed at a uniform rate; (2) the repeal of the tax inquisitor law; (3) the appraisement of railroad property and taxation of shares at a higher rate; (4) the limitation of the contraction of indebtedness by municipal corporations. Mr. Ingalls, representing railroad interests, objects to the increased taxation of railroads, as suggested.

Report of the Chief Labor Correspondent on the Strikes and Lockouts of 1893. Board of Trade, Labor Department, Great Britain. London, 1895.

In 1893 there were 782 strikes in Great Britain. Of these, 14 were lockouts; 42 per cent of the strikes were against the reduction of wages.

Forty-First Annual Report of the City Comptroller of Philadelphia for 1894. Pp. 221.

Twenty-Fifth Annual Report of the Board of Directors of City Trusts, Philadelphia, for 1894. Pp. 191.

Renseigmements statistiques sur le mouvement dans les asiles publics d'aliénés de la Suisse et dans les principaux e'tablissements privés. No. 99. Pp. 76. Berne, 1894.

This is the first issue relating to this subject, and introduces a series which will probably be of great value.

AMERICAN STATISTICAL LIBRARY.

The American Statistical Association possesses a Statistical Library, the result of forty years' collection, which is designed as a depository for statistical works of every nature. At present the Library is placed in rooms 31–33, Rogers Building, Massachusetts Institute of Technology, Boston. Its collection embraces not only the publications of the United States, but also many valuable reports issued by Statistical Bureaus of foreign countries. It also includes the very valuable statistical library collected by the former President, Dr. Jarvis, and bequeathed to the Association upon his death, in 1884. It is believed that the collection and preservation of reports which admit of a classification according to statistical groupings, will be of great public service, and the Association therefore earnestly requests a generous co-operation in still further enlarging the library in such directions.

Reports of vital and social statistics, registration reports, census documents, municipal reports, documents relating to public works, reports of trade, commerce, taxation, finance, insurance, industry, labor, health, crime, education, and religion are especially desired. Due acknowledgment of all donations will be given, and, when practicable, an exchange with the Publications of the Association will be made. It is especially desired that members of the Association will contribute copies of their writings.

For further information address

DAVIS R. DEWEY, *Secretary*,
Institute of Technology, Boston.

Publications of the American Statistical Association.

The New Series of the Association, issued quarterly, will be sent to members of the Association on payment of the annual assessment of two dollars. The subscription price is also two dollars per annum. Separate copies can also be purchased upon remittance of the advertised prices.

VOL. I. 1888–1889. NOS. 1–8. Pp. 492.

As No. 4 is out of print it is impossible to furnish this volume complete. Price, without No. 4, $3.50.

No. 1. Statistics of Water Power Employed in Manufacturing in the United States. By GEORGE F. SWAIN, S.B. 75 cents.

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Review of Reports of Bureaus of Labor Statistics for 1887. By PROF. RICHMOND MAYO SMITH.

Index to Reports of Bureaus of Labor Statistics for 1887.

Miscellany: Sanitary Reports of Dr. Hall and Prof. Porter; Pidgin's Practical Statistics; Act for Census of 1890; Census of Deaf-Mutes; Extension of Metric System. $1.25.

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Statistics of Municipal Finance. By PROF. HENRY B. GARDNER.

Miscellany: Newsholme's Vital Statistics; Manual of American Water-Works; Chronicle Fire Tables; Two Commercial Geographies; English Labour Statistics; Index of Journal of Royal Statistical Society; Tabulation of Statistics; Report of Seventh Convention of Commissioners of Bureaus of Labor Statistics. 75c.

No. 7. Prison Statistics of the United States for 1888. By ROLAND P. FALKNER, PH.D.

An Account of the Collections of the American Statistical Association. By HON. SAMUEL A. GREEN, A.M., M.D.

Galton's Statistical Methods. By PROF. JOHN DEWEY, PH.D.

Miscellany: Insurance Records; Municipal Budgets; Reports of Treasury Bureau of Statistics; Statistics of Citizenship in Massachusetts; Statistics of New Jersey; Railroad Statistics; Mechanical Statistical Devices; Minor Notices. 50 cents.

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